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July 1, 1971

From: Graduate Office, M. H. Appley, Dean

To: Mr. Robert McCartney, Secretary to the University

Subject: Annual Report, Fiscal 1971

This report covers the areas of activity for which the Graduate Dean is administratively responsible. These are:

S-11 Graduate Office

S-12 Computer Science Program

S-13 Research Computing Center

S-14 Water Resources Research Center

S-15 University of Massachusetts Press

S-16 Office of Research Services

S-17 Polymer Science and Engineering

S-18 Marine Science Program

S-19 Marine Station

Research Council

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1. Annual Appropriations

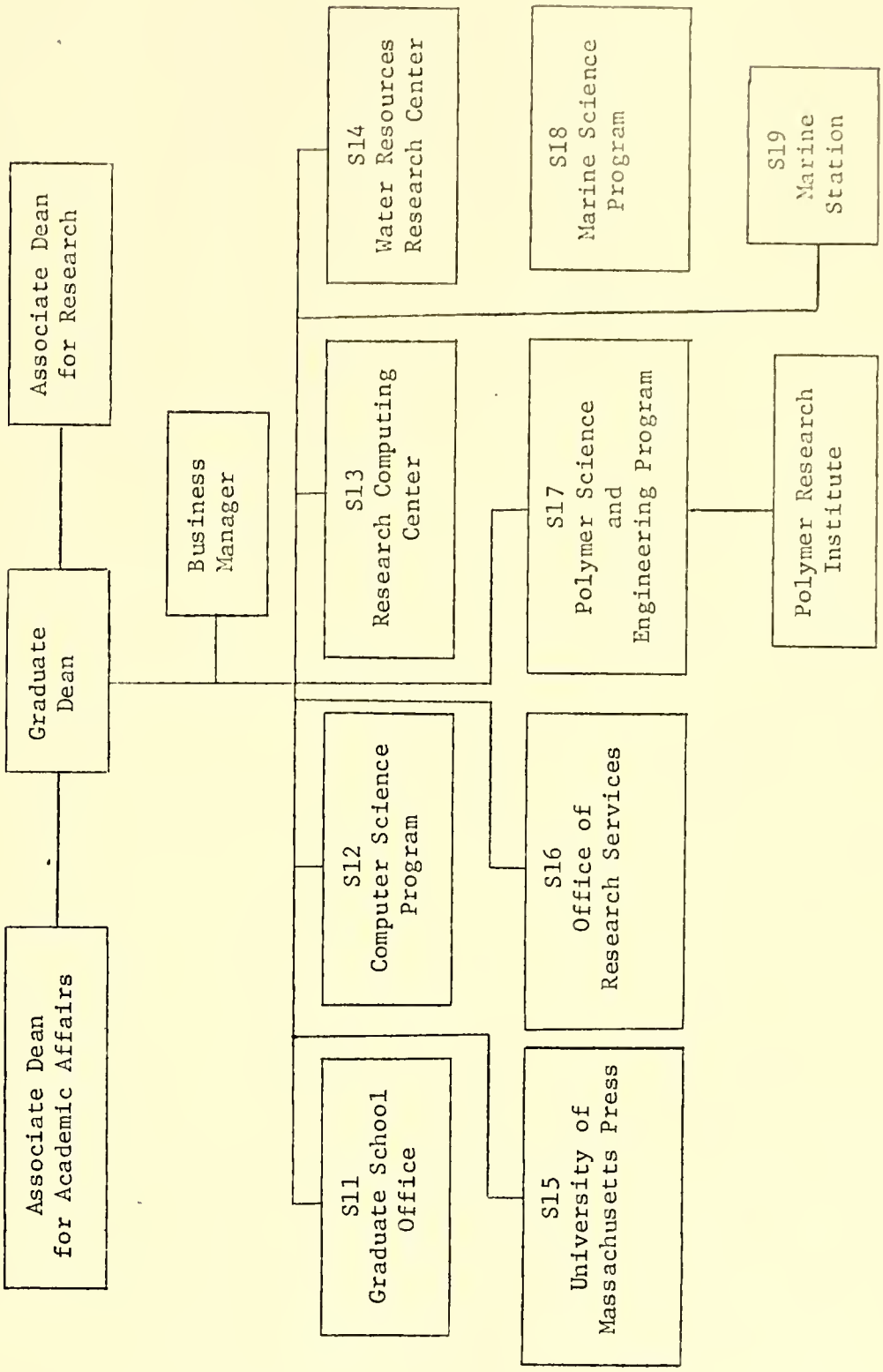
	'69	'70	'71
Graduate School Operating Budget	$161,005	$153,492	$210,000
Research Council			
Faculty Research Grants	70,000	65,000	84,500
Faculty Growth Grants	23,000	20,000	22,000
Massachusetts Review	10,000	11,000	13,000
Research Computing Center	529,900	956,862	1,139,500
Computer Science Program	138,548	129,749	144,860
University of Massachusetts Press	148,712	200,000	157,000
Water Resources Research Center	107,545	124,000	128,147
Office of Research Services	103,511	74,475	102,000
Polymer Science and Engineering	70,817	92,932	136,682
Polymer Research Institute	98,158	160,559	186,000
Marine Station	-	-	173,974
Marine Sciences	-	-	35,850
	$1,461,196	$1,988,069	$2,533,505

2. Personnel

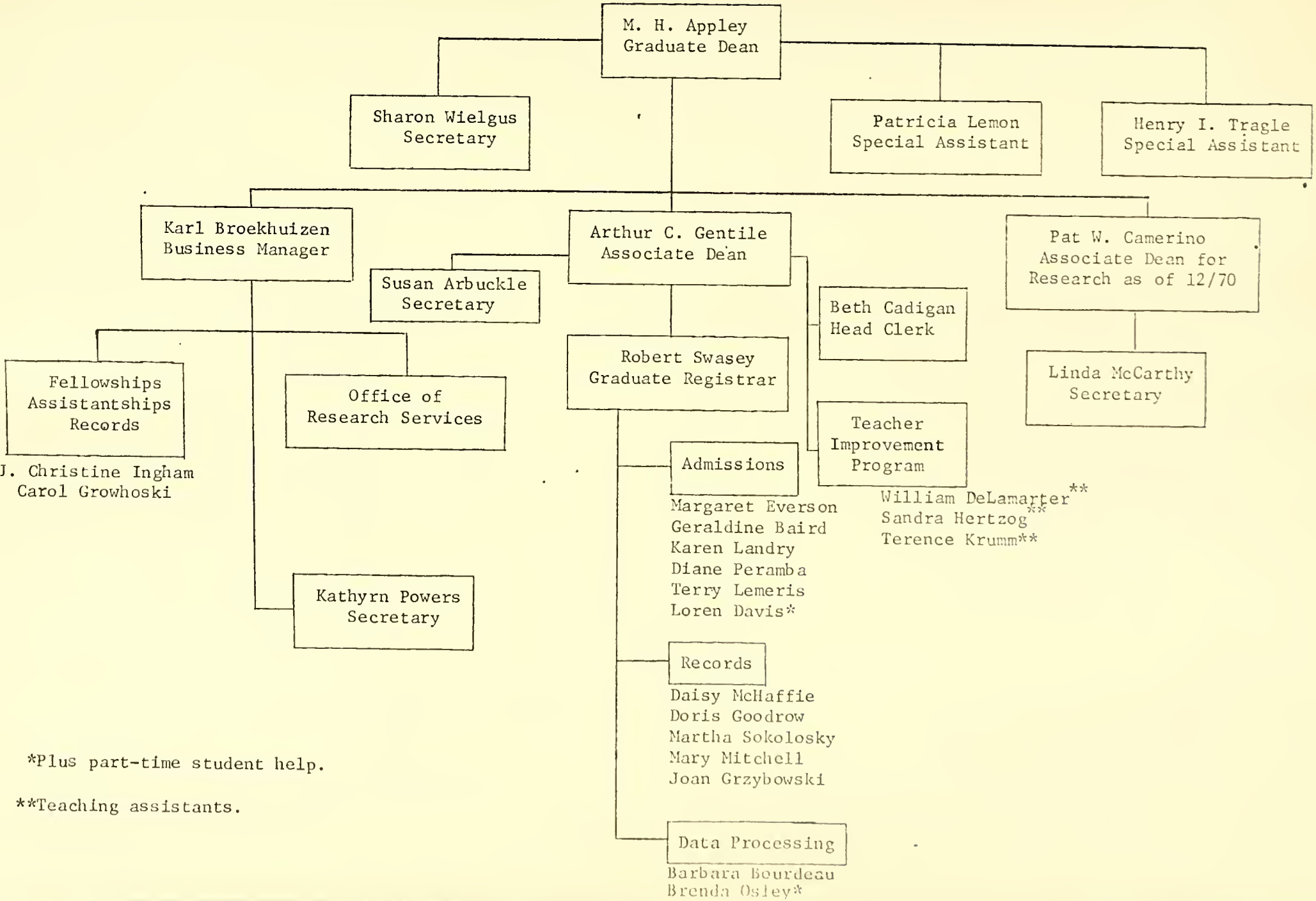
	Sept. '68	Sept. '69	Sept. '70
S11 Graduate Office			
Administrative	5	5	5-3/5
Non-Professional	17	17	23
S12 Computer Science Program			
Administrative	1	1	1
Faculty	3	4	[illegible]
Non-Professional	1	1	3
S13 Research Computing Center			
Administrative	5	5	5
Non-Professional	21	27	32
S14 Water Resources Research Center			
Administrative	1	1	2
Non-Professional	3	4	2
S15 University of Massachusetts Press			
Professional	4	6	7
Non-Professional	5	2	3
S16 Office of Research Services			
Non-Professional	8	9	9
S17 Polymer Science and Engineering			
Administrative	1	1	1
Faculty	3	2	3
Non-Professional	1	3	2
S18 Marine Science Program			
Faculty			1
S19 Marine Station			
Non-Professional			5

3. Organization charts for the departments of the Graduate School.

Graduate School Organization 1970-1971



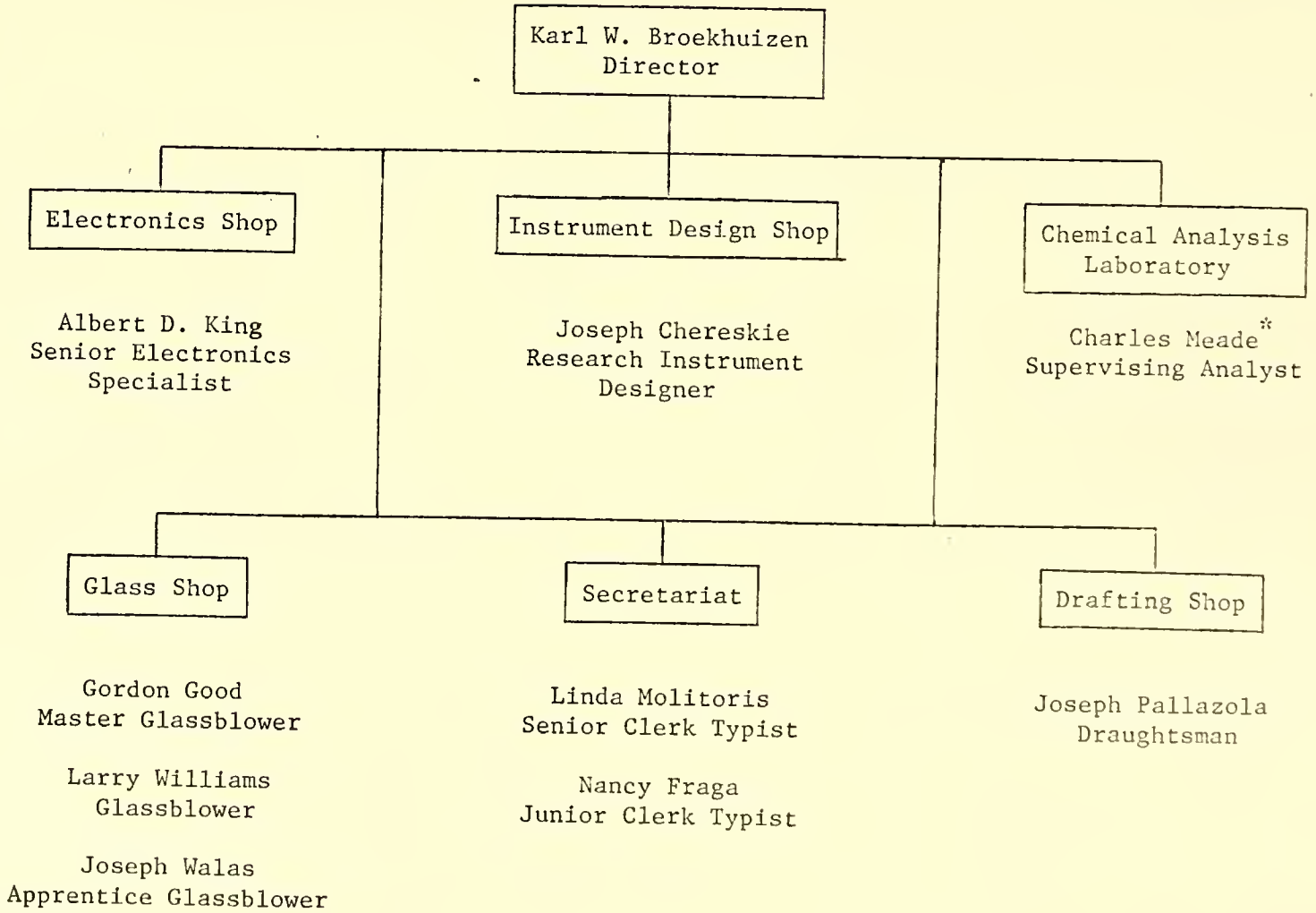
Graduate School Administration



*Plus part-time student help.

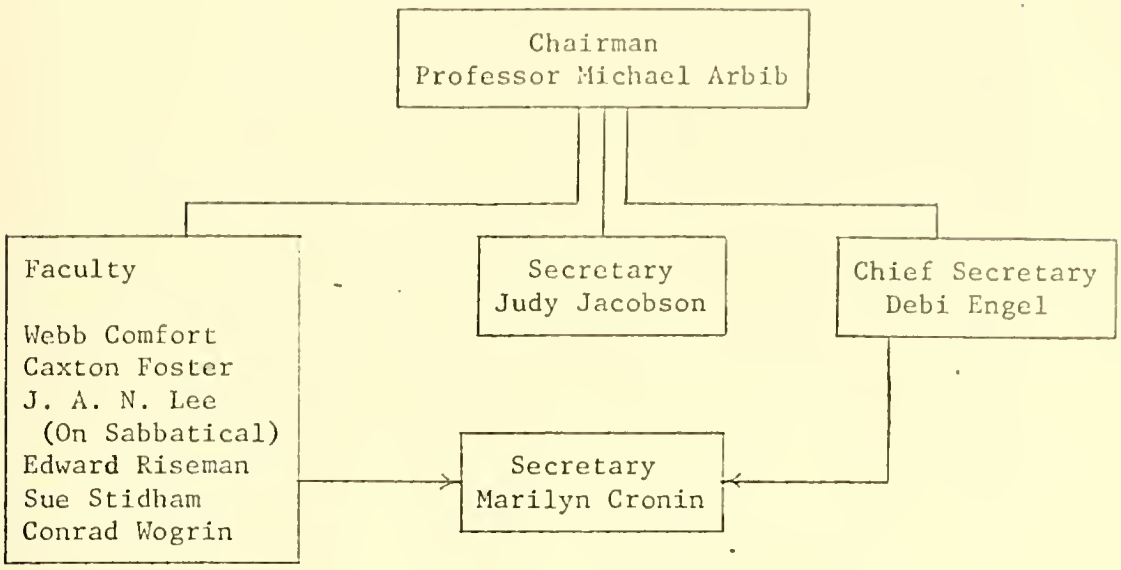
**Teaching assistants.

Office of Research Services

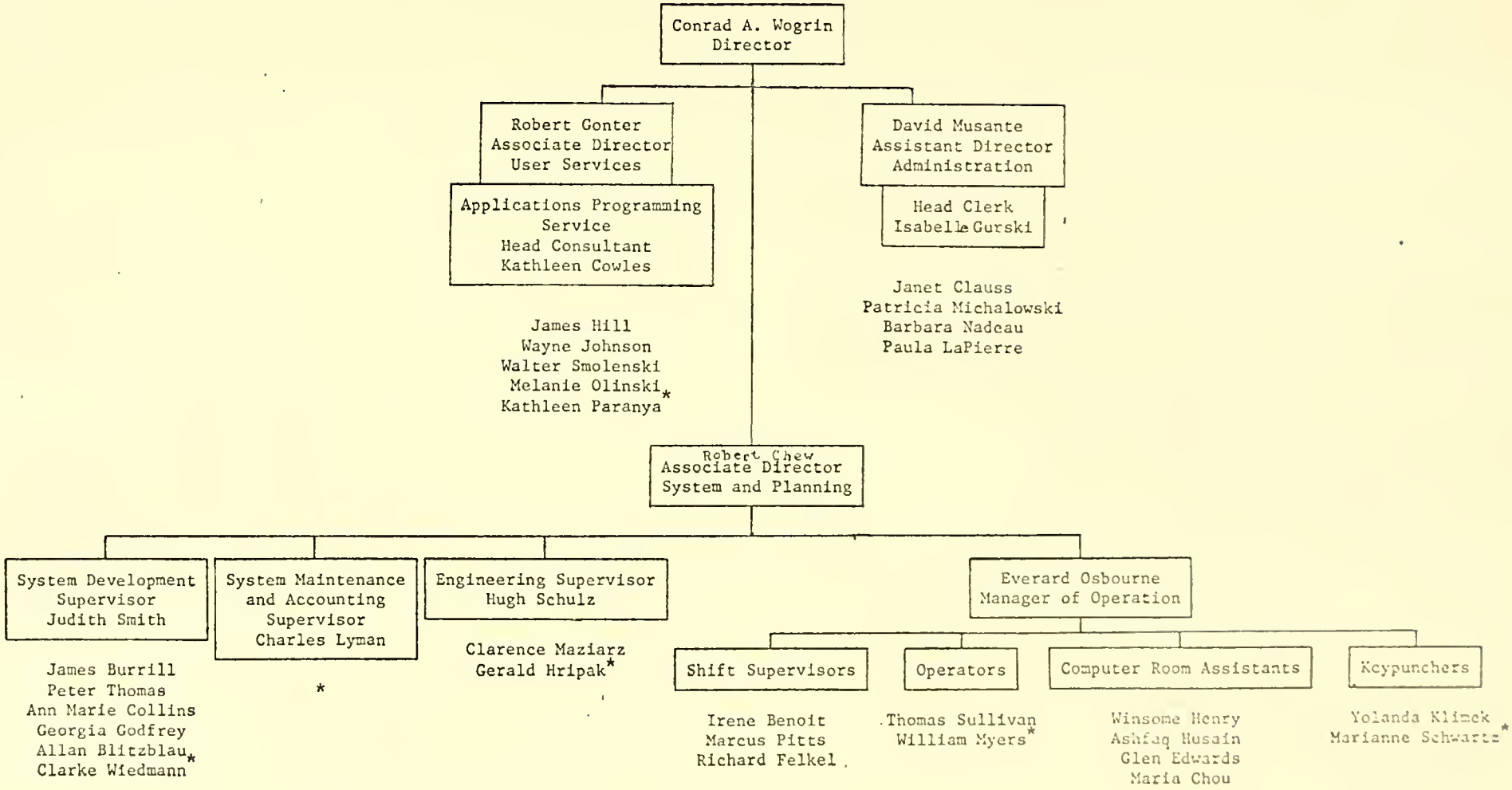


*Plus parttime student help.

Computer and Information Science

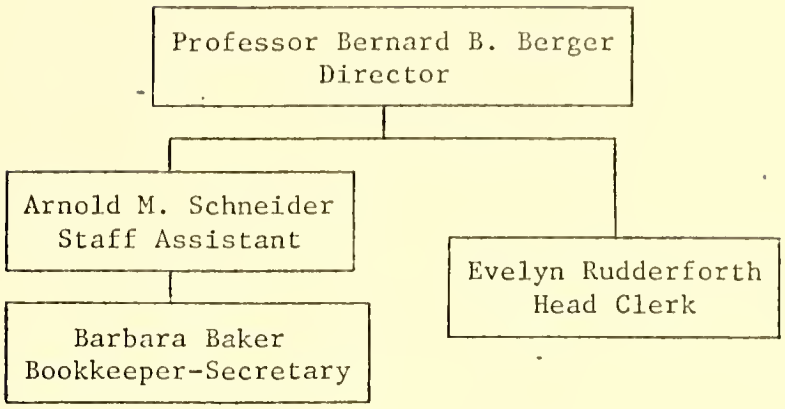


Research Computing Center

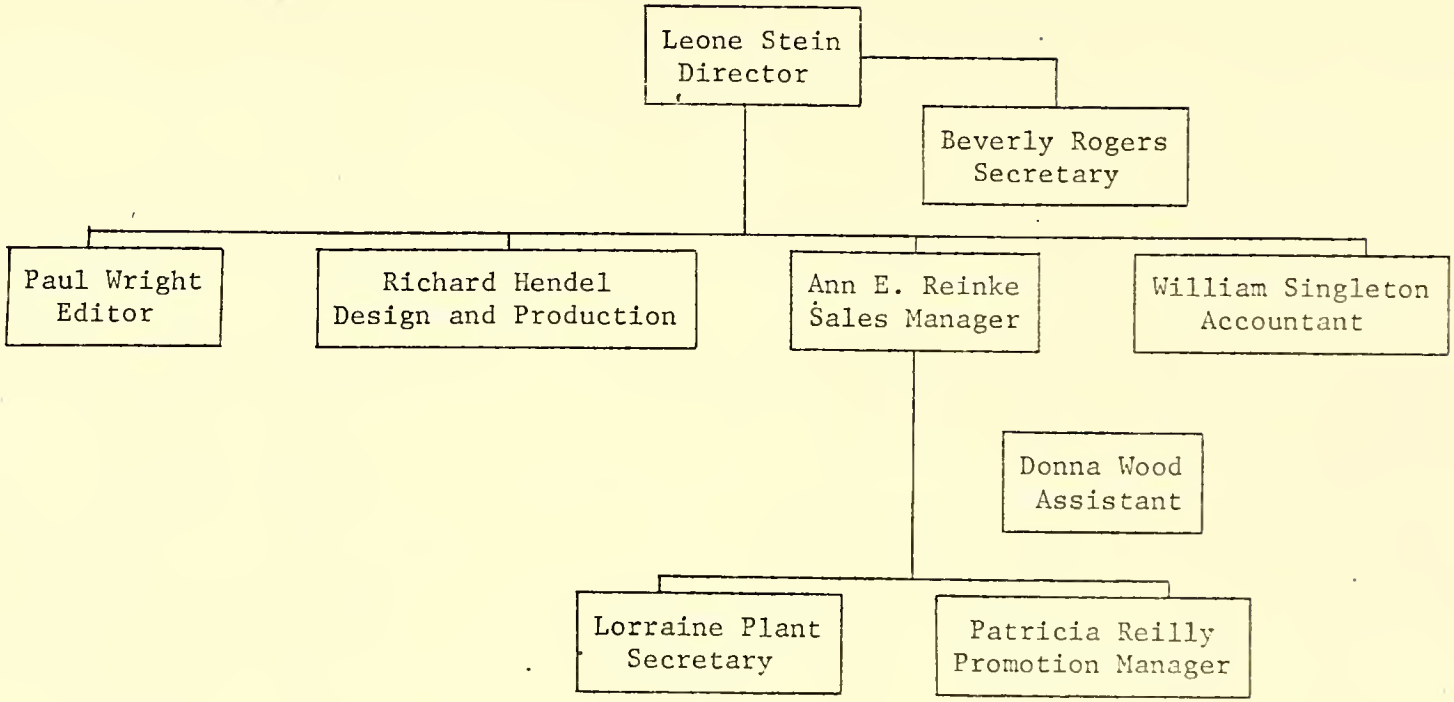


*Plus parttime student assistants.

Water Resources Research Center

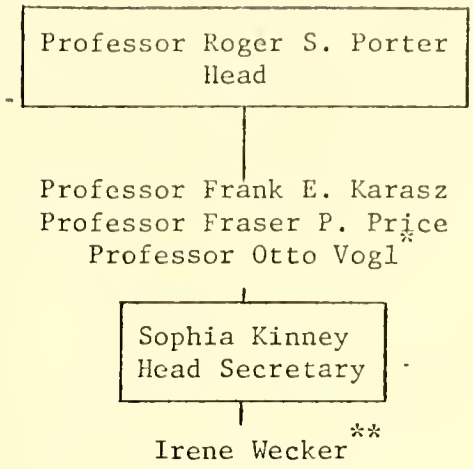


University of Massachusetts Press



Plus 1 intern and various work-study people.

Polymer Science and Engineering



*Adjunct Associate Professor Seymour Newman has a courtesy title and receives no remuneration for the occasional lectures he delivers.

**Plus one parttime summer helper.

Polymer Research Institute

Commonwealth Professor Richard S. Stein
Director

Faculty of Natural Sciences and Mathematics

Associate Professor
William J. MacKnight
Professor
James C. W. Chien

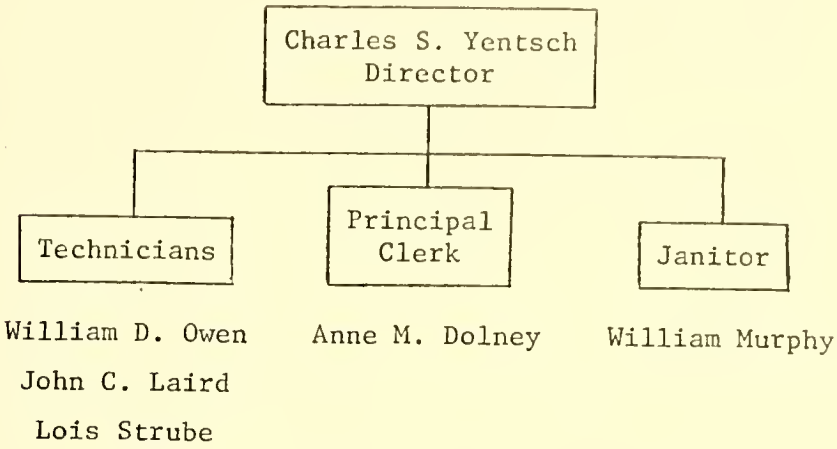
Graduate School

Professor Roger S. Porter
Professor Frank E. Karasz
Professor Fraser P. Price
Professor Otto Vogl
Adjunct Associate Professor Seymour Newman

School of Engineering

Professor
Robert W. Lenz
Professor
Stanley Middleman
Associate Professor
Robert L. Laurence

Marine Station



Plus various students and post-doctoral fellows.

4. Clientele served.

		% Increase '68-'69		% Increase '69-'70		% Increase '70-'71
S-11 Admissions						
Inquiries	24,386	47%	30,597	20%	36,571	20%
Applications Processed	7,715	-	9,571	24%	12,600	32%
Students Registered	3,107	10%	3,801	22%	4,464	17%
Degrees Granted						
Master's	671	20%	708	6%	773	9%
Doctoral	125	77%	154	23%	344	123%
Total	796	27%	862	8%	1,037	20%
Research Coordinator						
Non-University Grant Applications Processed	312		365	17%	316	-13%
Average Grant (Excluding Institutional Grants and Educational Project Grants	25,655		$25,018	-2%	$30,542	22%
Faculty Growth Grants ($1000) Awarded	25	8%	23	-8%	22	-4%
Faculty Research Grants Awarded	129	-4%	170	32%	156	9%
Average Amount Awarded	$543	16%	$385	-29%	$580	51%
S-12 Computer Science						
Number of Majors Enrolled	25		33	32%	41	24%
Others Taking CS Courses	873		1,026	18%	864	116%
S-13 Research Computing Center						
Total Number of Accounts	886		1,033	17%	975	-6%
Departments Served	47		60	28%	63	5%
Student Users/Semester	3,137		3,700	18%	3,925	6%
Faculty Users	590		610	3%	607	-
Total Jobs Run	384,400	353%	915,316	138%	1,375,950	50%
S-14 Water Resources Research Center						
Faculty Working on WRRC Projects	26		21	-19%	16	-24%
Publications	10		19	90%	10	-47%

S-15 University of Massachusetts Press

Titles Published	10	10	-	11	10%
Books Distributed	13,000	14,500	12%	18,000	24%

S-16 Polymer Science and Engineering

Students Majoring in PSE	36	49	36%	50	2%
Others Taking PSE Courses	8	10	25%	15	50%

Polymer Research Institute

Seminars Given	43	53	23%	49	-8%
Teachers Attending Summer Institutes				22	
Student Projects Advised and Supported	39	47	21%	88	87%
Faculty Research Projects	23	31	35%	27	-13%

S-18 Marine Sciences

Students	13

S-19 Marine Station (Facility opened Fall 1970)

Student	1
Researchers Using Facilities	8
Faculty Using Facilities	2

5. Faculty publications, research grants, research projects, and other professional activities.

M. H. Appley, Graduate Dean

Publication

On the concept of psychological stress. In W. C. Howell & I. L. Goldstein (eds.), Engineering Psychology: Current Perspectives in Research. New York: Appleton-Century-Crofts, 1971. Pp. 584-585, (with R. Trumbull).

Grants

NIMH #5 T01 MH11823-02	Graduate Training in Experimental Psychology	$42,071
NSF #GB-19643	Adaptation-Level Theory Conference	$ 3,000
NASA #NGT22-010-008	Training Grant	$70,000
NSF #GU-3448	Institutional Grant for Science	$138,880

Other Professional Activities

Grant Referee For: National Science Foundation
National Institutes of Mental Health

Committees: Massachusetts Board of Higher Education: Study Committee on Graduate Education, Professional Education, and Research

National Institutes of Mental Health: Alcoholism and Alcoholic Problems Review Committee

New England Psychological Association: Steering Committee

American Psychological Association: Committee on Program Innovations

American Psychological Association: Task Force on Manpower

New England Association of Graduate Deans

Eastern Psychological Association

Council of Graduate Schools in the United States

New England State University Graduate Deans

Massachusetts Committee on Law Enforcement and Criminal Justice

Editorial Consultant To: Psychological Review
Physiology and Behavior
Journal of Personality and Social Psychology
Canadian Journal of Psychology

Invited Participant in Three Symposia at the 1970 APA Convention:
--What Experimental Psychology Has to Offer - Donor, Learning Theory and Principles; Recipient, the Classroom. Title: Is intrinsic motivation achievable?
--Mental Health Training. Title: Revolution in Professional Training
--Psi Chi Symposium. Title: Manpower problems in Psychology: Are We Turning Out Too Many Ph.D.'s in Psychology?

Karl Broekhuizen, Business Manager

Professional Activities

Member of: Eastern Association of College and University Business Officers
Business Managers of Massachusetts, Institutions of Public Higher Education
National Council of University Research Administrators
Society of Research Administrators

Pat W. Camerino, Associate Graduate Dean for Research

Professional Activities

Member of: National Council of University Research Administrators
American Association for the Advancement of Science

Arthur C. Gentile, Associate Graduate Dean

Publication

Plant growth. Garden City, New York: Natural History Press, 1971.

Grants

NSF #GZ-2027 Graduate Traineeship Program $108,464

USPHS #5 KO5 FR07048-05 Biomedical Sciences Support Grant $ 65,085

Robert Swasey, Graduate Registrar

Professional Activities

Member of: American Association of Collegiate Registrars and Admissions Officers

Henry I. Tragle, Special Assistant to the Dean

Publications

The Southampton Slave Revolt of 1831. Amherst: The University of Massachusetts Press, 1971.

Styron and his sources. The Massachusetts Review, Winter 1970, 11(1), 134-153

Other Professional Activities

Member of: American Historical Association
Organization of American Historians

Invited Participant in National Association of Archivists at the National Archives Panel Discussion of the Use of Documentary Material in the Study of World War II.

6. Major accomplishments of the Graduate School, 1969-1970.

a. Degrees Granted. The total number of advanced degress exceeded 1,000 this year for the first time in the history of the University, reflecting the growth of the Graduate School in the past several years. (The number of degree recipients for the past three years is shown in Table I.)

b. New Graduate Degree Programs. During the past year the Board of Trustees approved a new Master's Degree in Public Administration and updated the Doctorate in Speech to encompass rhetoric, speech (theater), education, mass communications, speech and hearing sciences.

New Ph.D. programs have been proposed in Education (currently offering the Ed.D.) and Computer and Information Sciences (now offering graduate work only at the master's level) and are currently being evaluated. Master's degree proposals are also pending in Hotel and Restaurant Management and Urban and Regional Administration.

c. Graduate Enrollment. Total graduate enrollment increased from 3,801 in 1969-1970 to 4,464 in 1970-1971. While a number of graduate programs remained at about the same enrollment level as in the previous year, only three, Agricultural and Food Economics, German, and Physics, had any appreciable decrease, and a number increased their enrollments substantially. The latter included Art, English, French, Spanish, History, Music, Philosophy, Slavic, Geology, Economics, Psychology, Speech, Business Administration, Education, Electrical Englneering, Industrial Engineering, Mechanical Engineering, Public Health, Computer Science, and Marine Science.

d. Formal Opening of the Marine Station. On May 19, 1971, the formal dedication of the Marine Station at Hodgkins Cove was held. President Wood made the dedicatory address, and Senator William Saltonstall, a staunch supporter of the University's program in the Gloucester area, gave a reception afterward. Professor Charles Yentsch, station director, and his primarily grant-supported research team, have been actively using the station facilities since the first of the calendar year.

e. The Cape Ann Society. A number of citizens of Gloucester have banded together "to promote, for educational purposes, a program of scientific analysis and research in the field of marine science; particularly as it relates to man's environmental and ecological needs." Since its incorporation, the Cape Ann Society has raised the money with which a 42-foot research vessel was purchased for the benefit of the marine station. Professor Charles Yentsch, new director of the Marine Station, has worked closely with the Cape Ann Society since its inception.

f. Chairman for Computer and Information Science. This year, Professor Michael Arbib took over the duties of Chairman for the Department of Computer and Information Science, releasing the Acting Chairman, Professor Conrad Wogrin, to devote all his time to his duties as Director of the Research Computing Center. Professor Arbib, recruited from Stanford University, is a widely-recognized cybernetician and will work to expand the present efforts of the Computer Science Program from computer architecture to include computational analysis and cybernetics. We were indeed fortunate in attracting Dr. Arbib to the University.

g. Increased Computer Capacity at the Research Computing Center. During the past year, the Research Computing Center, under the full-time direction of Professor Wogrin, has replaced its CDC 3600 computer with a CDC 3800. This provided an increase of 51% in the memory as well as a much greater speed of operation. The storage space available to users has also been increased from 40 million to 110 million characters. The numbers of student users and jobs processed by the Center continues to increase.

h. Program Review Procedure. All proposals for new graduate programs (both master's and doctorate) are now submitted for external as well as internal review. Departments are required to prepare a document showing need for the program (both expected applicants and placement possibilities for graduates), appropriateness to the University, availability of qualified and experienced faculty, adequacy of facilities, library holdings and other resources, relation to other existing programs both in the University and elsewhere, and the nature, size and expected costs (both direct and indirect and both short- and long-range) of the proposed program. The document is reviewed in the Graduate Dean's office and evidence of administrative support obtained (from the appropriate dean and the Provost). Proposals failing to satisfy any of the above criteria are refused or returned for revision. Once the Graduate Dean and the Curriculum Committee of the Graduate Council tentatively accept a proposal, a mutually acceptable group of specialists in the field in question is invited to evaluate the proposer and the proposal. (Such groups may include from 2 to 6 members and would be asked to review the proposal by mail in the case of an ordinary master's degree program or to visit the campus for two or three days in the case of doctoral proposals or unusual master's degree proposals.) Reports of the outside groups are reviewed by the Graduate Dean's office, the Curriculum Committee, the proposing department, and the Provost's office. If serious deficiencies are noted, the proposal may be denied. Suggested changes may be made by the department or reasons for rejecting change offered. The Graduate Dean then recommends a course of action to the Curriculum Committee and in turn recommendations go to the Graduate Council and the Faculty Senate,and, through the Chancellor, to the Faculty and Educational Policy Committee of the Board of Trustees. Successful

proposals may require, depending on the care of their preparation and the support level of the program involved, from 3 to 12 months to reach the Board of Trustees. Hopefully, they would not reach this level unless all prior screenings led to a collective judgment that the proposed program was needed, academically sound and economically feasible.

External review is expensive, but quite helpful. It is now required of all new programs and, to the extent that budgetary limitations permit, will be used as part of a review of existing programs now being undertaken by the Graduate Dean's office at the request of President Wood and Chancellor Tippo. With over 100 graduate programs now in existence, however, it should be clear that it will be several years before the process is completed.

i. ACE Report. On January 3rd of this year, the American Council on Education (ACE) released the findings of its 1969 survey of graduate programs. This report summarizes the rankings assigned to doctoral departments in the 130 leading universities by some 6,000 scholars surveyed in 1969. It replicates and extends a previous ACE study conducted by Cartter in 1964. Without going into details of the methods, categories and limitations of these studies - and we have been severely critical of some of the shortcomings of these ACE reports, as have many other graduate deans - we can report with some pride an increase from four to seventeen listings for University of Massachusetts programs over the five-year period (see Table II). In 1964, only four of our programs (bacteriology-microbiology, entomology, psychology and zoology) obtained ratings of "adequate plus" or better. In 1964, all four were given higher ratings, and 13 additional programs also achieved quality ratings. Two of these (botany and German) were in the "top twenty" departments in the nation. Five (chemistry, microbiology, physiology, psychology, and zoology) were in the next highest category, and ten others (developmental biology, English, ntomology, geology, history, mathematics, molecular biology, political science, population biology, and sociology) were in the quality level just below. Only two of the nineteen University of Massachusetts programs that were rated (biochemistry and economics) fell slightly short of a level of quality entitling them to be listed as of 1969. Both programs have improved significantly in the last two years, and could well achieve listing if the survey were repeated this year.

Others have attempted such institutional rankings. We were pleased to learn that in one such attempt at ranking of universities, the State University of New York at Buffalo reported greater improvement for themselves (23 rankings advanced) than for any other institution except one - the University of Massachusetts (improvement of 31 rankings)! According to the Buffalo rankings (the bases of which are debatable), Massachusetts moved from 84th place to 53rd place in overall quality among the nation's leading institutions.

We should note that ACE ratings were made only of those programs which had already produced doctorates and only in some areas. Thus, newer Massachusetts doctoral programs (e.g., anthropology, astronomy, engineering, languages other than German and English, philosophy, physics, etc.) were automatically excluded from consideration. All things considered, and despite serious limitations of the study, the University of Massachusetts did extremely well in these external peer ratings of the quality of our graduate programs.

j. Institute for Man and His Environment. Under consideration for over a year by an interdisciplinary steering committee headed by water resources specialist Bernard Berger, an Institute for Man and His Environment was approved by the Graduate Council and the Faculty Senate and established on the Amherst campus by the Board of Trustees in April of this year. Dr. Dayton Carritt, well-known oceanographer and recent Provost of Nova University in Florida, assumed the directorship of the new Institute, soon to be joined by Dr. Carl Swanson, Dean of Johns Hopkins University, who will become Associate Director for Educational Programs. The Graduate School served a coordinating role for the faculty groups involved in establishing the Institute and hopes that it can fill an important function in giving sharper focus to the many environmental activities of the University.

k. Minority Student Fellowships. In the Fall of 1969, the Graduate School in cooperation with the A. P. Sloan Foundation established four graduate fellowships for minority students. Under this arrangement, the University provided one-half of the funds; the other half was supplied by the Sloan Foundation. The Sloan funding was for a period of one year and was secured through the efforts of a member of the faculty of Polymer Science and Engineering and the Graduate School.

In the Fall of 1970, the Graduate School assumed the complete cost for continuing the Sloan fellowships and increased its funding of fellowships for minority students to provide a total of six special fellowships.

In the Fall of 1971, Graduate School funds will be provided to fund a total of ten special fellowships for minority students.

Subject to adequate funding, we hope to be able to increase the total number of fellowships for minority students over the next several years. Outside resources are being sought to supplement the meager internal funds available for this purpose.

7. Special projects and programs operated by the Graduate School during the fiscal year 1970-71.

a. Biomedical Sciences Support Grant. For a number of years, the University has received an annual grant from the U. S. Public Health Service to be used to promote research and training in the health-related sciences. During the fiscal year 1969-70, this amounted to $68,882. A committee consisting of John Brandts (Chemistry), Martin Sevoian (Animal Science), Ernest Dzendolet (Psychology), James Snedecor (Zoo ogy), Robert Mortlock (Microbiology), and Arthur C. Gentile (Associate Dean of the Graduate School), Chairman, allocated funds from this grant on the basis of applications received from faculty members and groups.

In the year 1970-71, the available funds were used to support health-related research and training in sixteen departments: Anthropology, Biochemistry, Chemistry, Chemical Engineering, Fisheries Biology, Mechanical Engineering, Microbiology, Physical Education, Physics, Polymer Science and Engineering, Psychology, Public Health, Sociology, Speech, Veterinary and Animal Science, and Zoology.

b. Office of Research Services. The Office of Research Services continues to operate under conditions of decreasing funding, since its support is derived from the University's NSF Institutional Grant. As in many areas of federal financing, funds for this type of activity are being diverted to other functions that are perceived to be more critical. Diminished funding notwithstanding, there was increased use of each of the services provided by this office.

The Glass Shop has had its proposal for a course in scientific glassblowing (Chemistry 705) approved, and expects to offer it next year. There are already a number of students interested in taking advantage of this offering.

Services of the Chemical Analysis Laboratory continue to be in heavy demand. Because of its unique capability and excellent reputation plans are underway to make its services available to other academic institutions in the eastern part of the country.

The Secretariat and Electronics Shop are also meeting the growing needs of the University community, though increased capacity in both areas could readily be absorbed.

Next year, we look forward to occupying new quarters in the Graduate Research Center. This will enable the Office to operate as a more cohesive unit and will allow for more efficient and effective utilization of space.

c. Office of Graduate Degree Requirements. The rapid increase in number of graduate degrees awarded each year (see Table I) made it necessary to set up a separate Degree Requirements office in the Graduate School to review credentials of students being recommended for degrees and to monitor matters pertaining to degree requirements and Graduate Faculty. Dr. Henry I. Tragle assumed responsibility for this office on July 1, 1970.

d. Graduate Alumni Program (GAP). The rapid increase in number of graduate degrees granted has made it important to start collecting information on graduate alumni and to try to maintain contact with them. To this end, a Graduate Alumni Program has been set up under the direction of Head Clerk Beth Cadigan. She will work closely with the Associate Alumni Office.

e. Teacher Improvement Program (TIP). Graduate teaching assistants on the Amherst campus of the University of Massachusetts assume about 20% of the undergraduate teaching load. Thirty-five departments on campus use teaching assistants, yet only five of them offer their teaching assistants any formal training. These facts coupled with growing concern for improving undergraduate education at the University of Massachusetts led the Graduate School to propose a program to aid graduate teaching assistants in assuming their teaching responsibilities.

In June of 1970, an experimental Teaching Improvement Program was established by the Graduate School with the approval and support of the Chancellor's and Provost's offices. Staff and equipment were acquired through the Educational Improvement Fund. Graduate teaching aasistants were chosen as staff, because it was felt that teaching assistants seeking aid might be more receptive to help from fellow teaching assistants than from faculty members, and that experienced teaching assistants could empathize with problems encountered by novices. The staff was chosen from a broad range of disciplines and had demonstrated success as teaching assistants.

The heart of the program is a videotape facility, which consists of two portable units and a studio camera, console, and television set. All staff share the task of videotaping, but evaluation is performed by the staff member most competent to help a teaching assistant in a particular field. A teaching assistant whose class is taped may view his tape and discuss his performance with a staff member, view it alone, or view it with a faculty member if he so desires.

Over two hundred teaching assistants attended all or part of the orientation program held in the Fall. A handbook was prepared and distributed to all teaching assistants in September 1970. During the first year of operation, approximately one hundred teaching assistants and faculty members used the TIP facilities to have classroom performance taped and evaluated.

One member of the staff has been working with Professor Walker Gibson of the English Department to develop demonstration tapes for the Rhetoric Program. They have completed one and are working on more, to be completed this summer. In addition, the program has provided demonstrations and discussions of videotape as a teaching and learning tool to departments on request.

8. Future plans and needs.

a. Are Graduate Schools Overproducing? Stimulated by reports of greater difficulty in placement of holders of graduate degrees (doctorates, particularly), newspaper editorials - and some university and public officials - throughout the country have been suggesting that Ph.D.s may be a "glut on the market" and that their numbers should be severely cut back. Cartter's report for the American Council on Education some years ago predicted such an event, and he and others have recently again indicated that supply may now be more than ample to meet existing demand.

We have tried - and continue to try - to carefully analyze such "hard" data and manpower projections as are available. Our best current judgment suggests that an oversupply indeed appears to exist, but only in certain job markets, primarily in faculty openings as colleges and universities reach maximum size. The manpower needs outside this particular preferred market is much less readily identified. Further, the present situation is confounded by the severe federal funding cutbacks which have thrown large numbers of older graduate degree holders on the market within the past year or year and a half. Whether, when, where, and how these highly trained persons will be reabsorbed remains uncertain. There is some indication, however, that they are reentering the roles of the employed as replacements (displacements?) for persons less well educated.

Responding to the gloomy picture being painted for the future of graduate education in America, National Science Foundation Director William McElroy takes a more positive view. He has pointed out that for the first time in the nation's history, we may be attaining a level of production of doctorates that would permit state and community colleges, secondary schools, various levels of government, and business and industry to employ persons at this higher level of education. Previously, such persons were absorbed primarily in academic and select government specialty posts.

Cartter's ominous predictions and the reports of the Modern Language Association and some other professional-association employment agencies would, it seems, reflect such factors as "market conditions" for the higher prestige college teaching posts, the effects of current federal policies and of present economic readjustment in business and industry. Longer range outlook for professional manpower of the Bureau of Labor Statistics suggests favorable prospects for most fields in which Ph.D. work is being done (at the University of Massachusetts, at least).

While we must clearly continue to study the situation carefully, it would be both premature and irresponsible for the University to direct the curtailment of programs across the board on the basis of the unreliable information currently available. Evidence to date suggests a reasonably good placement record for our graduates of this year. We would hope that our growing reputation as a Graduate School will continue to place our graduates in a favorable position to compete for employment with graduates of other institutions. Attention to placement may well need to be increased as shifts in the job market take place.

b. Teaching Improvement Program. The modest videotaping program begun last year to aid Graduate Teaching Assistants in improving their classroom performance (and becoming better prepared for teaching positions) continues to be used by more and more of the University's TAs, but our inability to increase funds for personnel and equipment limits the scope of the Program's efforts. With some 900 prospective clients, a staff of three half-time persons is hard pressed to provide the kind of service that is needed. More support could be used for this small but useful program.

c. Research. The establishment of a position for an Assistant Dean for Research has permitted more concentrated effort in the Dean's Office in the areas of research coordination and assistance to faculty seeking external (primarily federal) support for training and research. This next year will see an intensification of efforts to identify the locations and nature of changing federal sources of support (a regular Research Support Information Newsletter is now issued by this office) and to complete a Research and Training Grant Information Retrieval System now in development. This system will provide a basis for more critical analysis of the University's research efforts and permit instant identification of past, current, and planned research activities. With availability of sufficient programming assistance and computer time, this System should also be able to provide an inventory of faculty and staff research interests and capability for selective matching with external fund availability.

An attempt will also be made in this next year to reexamine, update and codify University research policies in such areas as the protection of rights and welfare of human subjects, animal care, and "classified" research. A Research Manual is planned, incorporating these and other policies along with grant application procedures and an updated description of available research support facilities (e.g., Computing Center, Chemical Analysis Laboratory, etc.)

d. Graduate Student Support. Unlike undergraduate students, who traditionally rely - in part at least - on parental support, the typical graduate student is no longer a family dependent, is often married and himself/herself a parent, and finds himself in need of support during the period of full-time devotion to graduate study. Such support typically derives from four main

sources: (1) part-time teaching assistantships; (2) federal fellowships; (3) research assistantships derived from federally-sponsored faculty research grants; and (4) institutional (allotment or endowment) fellowships. Current federal policy has led to a discontinuance of practically all federal fellowship funds and to a levelling off of federally-sponsored research assistance. Teaching assistantships, the number and location of which depend upon undergraduate teaching needs, cannot be increased sufficiently to make up the difference. Since the best students continue to be competed for by numbers of graduate schools, they naturally choose to attend the one among equals that provides support. Eliminating ourselves from competition for many of these, by virtue of reduction in resources available to us, means that we possibly reduce the quality of the graduate student body by losing to each program the few best students whom we cannot support. Without endowment sources, the gap created by withdrawal of federal funding will need to be m de up by either state scholarship support or the soliciting of private gifts for graduate scholarship/fellowship purposes.

(This is by no means a plea for automatic support of all graduate students. Funds should be available to provide fellowships for between 5% and 10% of graduate students on the basis of quality and promise. Present prospects would provide for fewer than 2%.)

TABLE I

Graduate Degrees Granted From October 1968 to May 1971

	Oct.'68	Feb.'69	May'69	Total '68-69	Oct.'69	Feb.'70	May'70	Total '69-70	Oct.'70	Feb.'71	May'71	Total '70-71
M. Land. Arch.	2		10	12	2	2	8	12		1	5	6
M. A.	68	40	70	178	42	48	70	160	51	32	58	141
M. Fine Arts		6	22	28	3		13	16	3	1	13	17
M. A. T.	18	4	16	38	19	15	23	57	12	9	22	43
M. Ed.	48	20	46	114	78	36	64	178	64	48	107	219
M. S.	73	36	76	175	59	36	64	159	67	47	83	197
M. B. A.	17	6	24	47	15	17	23	55	25	21	40	86
M. S. Acc'ting		1	6	7	3	4	1	8	1			1
M. S. Mgt. Sci.							1	1		1		1
M. S. Ch. E.	1		4	5	1	6	5	12	2	6	3	11
M. S. Civil E.	7	6	7	20	1	2	6	9	5	2	5	12
M. S. Env. E.		1	1	2	3	2	1	6				
M. S. Elect. E.	2	6	8	16	1	1	2	4	4	3	2	9
M. S. I. E.	2	2	5	9	1	1		2	3	2	6	11
M. S. M. E.	2	6	7	15	6	4	5	15	2	5	5	12
M. Music	4		1	5	5		4	9	3	1	2	6
Total Master's	234	134	303	671	239	174	290	703	242	179	351	772
Ph. D.	47	24	36	107	48	25	45	118	90	37	64	191
5-College Ph.D.		1	5	6	4	1	2	7	1		4	5
D. Ed.	4	1	7	12	10	5	14	29	21	12	35	68
Total Doctorate	51	26	48	125	62	31	61	154	112	49	103	264
Total Graduate Degrees	282	160	351	796	301	205	351	857	354	228	454	1036

TABLE II

Rated Quality of Seventeen University of Massachusetts Graduate Programs in 1964 and 1969 ACE Surveys of Graduate Education

1964			1969	
"Adequate Plus"				
Bacteriology-Microbiology	Botany	3.2*	Geology	2.1
Entomology	German	3.1*	History	2.1
Microbiology	Microbiology	2.7	Mathematics	2.1
Zoology	Zoology	2.7	Molecular biology	2.1
	Chemistry	2.6	Population biology	2.1
	Psychology	2.6	Sociology	2.1
	Physiology	2.5	Political science	2.0
	Developmental biology	2.3	Biochemistry	1.9**
	English	2.3	Economics	1.7**
	Entomology	2.1		

*Among "top twenty" departments in discipline

**Below level (2.0) for quality listing

UNIVERSITY OF MASSACHUSETTS

MEMORANDUM

From Associate Graduate Dean for Research Date September 9, 1971

To Graduate Dean

Subject Transmittal of Annual Report - FY 1971. SPONSORED ACTIVITIES

It is a pleasure for me to transmit to you my annual report on the "Sponsored Activities" of the Faculty of the University at Amherst. The contents of this report demonstrate how well our Faculty has fared even in these difficult times of a restricted budget for research and scholarly work.

In the period July 1, 1970 - June 30, 1971, regular research grants-in-aid and contracts totaled $5.0 million in contrast to $3.9 million received during the period July 1, 1968 - June 30, 1969. Two years ago the total funds received for all sponsored activities amounted to $5.7 million; during the last fiscal year this level has grown to $9.3 million. Although the cost of a given research project can not be equated with the merit of the work itself, the fact that these funds have, in the aggregate, increased during a period of fiscal constraint, is indicative of the merit of our Faculty in national competition.

The data of this report also point out the critical dependence sponsored research has upon Federal sources of funds. In fiscal year 1971, over 80% of our sponsored support was contributed by Federal agencies. However, with changing National priorities in the support of research, our Faculty has turned to non-Federal sources of funds so that support from non-governmental agencies has grown two and one-half times during the past three years.

In many fields of scholarly work, small sums of support are required. In fiscal year 1971, Faculty Research Grants and Faculty Growth Grants were again used to provide these modest amounts. This report shows the wide distribution of these funds for proposals recommended by the Research Council during 1970-1971.

The final section of this report alludes to other activities occuring within my office. A sizable allocation of effort was applied towards the preparation of a Research Support Information Newsletter, which I hope has been of benefit to the University community. Plans are now underway to expand this activity. In the coming months, I also hope to initiate other informational activities related to research areas. It remains my intention to be of service to the Faculty as they in turn advance the educational and research functions of the University.

Pat W. Camerino

Pat W. Camerino
Associate Graduate Dean for Research

PWC/lm

UNIVERSITY OF MASSACHUSETTS AT AMHERST

SPONSORED ACTIVITIES

Annual Report - FY 1971

of the

Associate Graduate Dean for Research

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*These sections have been included only in the reports prepared for Deans, Department Heads/Chairmen and major offices of the University.

Preface

The University is one of the major agencies of our society concerned with both the preservation of our cultural traditions and the advancement of knowledge. The University of Massachusetts, in concert with other institutions, carries out these roles through its educational functions and its activities in research and scholarship. A clear distinction can not be made among those processes labeled "research", "scholarship" and "creative activities", since all of them lead to the required goal of the advancement of knowledge. An even greater difficulty is present if an attempt is made to label research as being basic, developmental or applied. A university has responsibilities for the fostering of all of these processes as its members seek new understandings. During the past year, the Faculty of the University has participated in many endeavors identified as research activities.

The vast majority of research within the University requires support from non-University sources, since the UMass budget contains no direct allocation for such activities. The Faculty must seek financial support from the Federal Government, the Commonwealth, industry, industrial foundations, private foundations and other sources through either contracts or grants-in-aid. Fortunately, Faculty members have been successful in many of their attempts to secure financial support in the current period of constrained budgets. However, the dependence upon the Federal sector makes the University community highly vulnerable to fluctuations arising from changes in National priorities.

Sponsored Research and Educational Activities

Sponsored research and educational activities within the University can be divided into the following categories:

- Research Projects
  - Regular Research Projects
  - Special Projects

Equipment Grants
Training and Fellowship Awards
Institutional Grants
Educational Projects

"Regular research projects" make up the greatest part of sponsored projects. These projects are the usual grants-in-aid or contracts awarded to individual investigators or groups of researchers to allow them to study a rather circumscribed set of problems. On the other hand, a "special project", as defined in this report, is one which has received a relatively large amount of support (usually on a non-recurring basis) to be used for a number of individual interrelated studies. If no distinction were made between these two types of awards, the resulting calculation of an "average" grant would be misleading. "Equipment grants" are specific awards for the purchasing of equipment for research and research training.

In fiscal year 1971*, Faculty at UMass/Amherst received 195 regular research projects amounting to $5,015,442. The "average" grant (or contract) would therefore be funded at a level of $25,700 (including indirect costs). During this period, one "special project" was funded at a level of $582,000. (This was a Departmental Development Award made to the Psychology Department by the National Science Foundation.) Six equipment grants received a total of $651,300.

In FY 1971 the University received 24 training or fellowship awards totaling $660,346 for an average grant of $27,500. Each year the University receives institutional grants from the National Science Foundation, the National Institutes of Health and the Office of Education (NDEA). In FY 1971 these three awards amounted to $586,074.

The last category of sponsored activities given in the above classifica-

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*Fiscal Year 1971 is the period from July 1, 1970, through June 30, 1971. In a similar manner, Fiscal Year 1970 is July 1, 1969, through June 30, 1970, and Fiscal Year 1969 is July 1, 1968, through June 30, 1969.

tion is that of "educational projects". In this report, this term refers to all projects for outside sponsored activities occurring in the School of Education. In FY 1971 a total of $1,846,174 was received for such projects. (This value, obtained from the School of Education, excludes the School's special trust funds. Because of the current lack of complete documentation for this area in the Office of the Associate Graduate Dean for Research, values reported in this summary were obtained from the Office of the Assistant Dean for Administration in the School of Education.)

For the period July 1, 1970, through June 1, 1971, the University of Massachusetts received $9,341,336 for sponsored activities. This level of funding does not include values for certain Federally supported activities such as construction, facilities, library grants, and student support. At the same time, this value does not include certain projects awarded to the School of Education (see below) nor does it include "Hatch Act" funds and related support received by the College of Agriculture from the U.S.D.A. Thus, the minimal level of support for sponsored activities received by the University of Massachusetts at Amherst in FY 1971 was $9.34 million. The largest portion of the reported support (53.7%) has been received for regular research projects. The distribution of these funds for the last three years is given in Table 1.

During the last three years, the total funds for sponsored programs have increased by $3.61 million (from $5.73 million in FY 1969 to $9.34 million in FY 1971). During this period, the support for regular research projects has increased from $3.915 million to $5.015 million, a difference of $1.1 million. On the other hand, institutional grants have decreased by $319 thousand. In FY 1969, regular research projects accounted for 68.2% of the total sponsored activity dollar and institutional grants for 15.8%. In the last year, regular research projects account for 53.7% whereas institutional grants furnish 6.2% of the sponsored funds. Support for educational projects has increased from

11.9% to 19.8% during this period.

The figures quoted here may be encouraging to some, since there is an observed increase in the level of funds for individual regular research grants. and contracts despite the increased competition for these funds. Numerous reports have testified to the difficulty of obtaining outside support for research. However, the Faculty at UMass appear to have fared well in their attempts to secure such funds. On the other hand, the University's flexible funds in the form of institutional support have decreased. Those Faculty members requiring support for research have been forced to seek such funding from non-University controlled sources to even a greater extent than before.

Sources of Funds for Sponsored Research

The backbone of sponsored research within the University is the individual regular research grant or contract. The strength of this backbone depends upon Federal funding. In the last few years, with a restricted Federal budget for research, the Faculty investigator has turned to private foundations, industry and industrial foundations and other sources for funding. The Commonwealth has not been an active participant in the direct support of research. Table 2 presents a distribution, by source, of the funds received for the support of regular research projects for the last three fiscal years.

In fiscal year 1969, Federal support for individual grants and contracts accounted for 94.1% of the $3.9 million contributed to these projects. Three years later the absolute level has increased to $5.0 million but the Federal sector now contributes 88.5% of these dollars. Within the category of Federal agencies supporting research, the National Science Foundation continues to be the major contributor. In the current year, the NSF money accounts for 32.8% of the Federal dollars for regular research projects. The Department of Defense contributes 14.2% of the Federal funds for individual grants and contracts, all of which are non-classified activities.

Another view of the levels of sponsored support can be taken by comparing the sources for other activities as well as for individual research projects. Table 3 shows the distribution, by source, for the support of all sponsored programs for fiscal year 1971.* The data indicate that at least 83% of all support is obtained from Federal Sources. It is of interest to note that at least 30% of the $9.66 million total comes from the National Science Foundation and at least 35% is furnished by the Department of Health, Education and Welfare. Moreover, no more than 7% of the total sponsored funding comes from the Department of Defense.

Academic Units Receiving Funds

The Office of the Coordinator of Research/Associate Graduate Dean for Research has had the responsibility for maintaining records of proposals submitted to outside agencies for the support of research activities. This office has been designated as part of the internal processing scheme for all submissions and is to be notified of all actions taken by outside agencies. Although these functions are performed for most individual grants, lapses have occurred. In order to verify its records, this office distributed a listing of individual grants and contracts for the last three years to each Department. Many of these Departments responded by indicating that no change was necessary or by correcting the submitted listings. The assumption was made that the lack of a response was indicative of agreement with the data. These listings have been the source for the data presented for individual research grants and contracts.

In past summaries of sponsored research, considerably larger values have

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*The total reported in this table amounts to $9,663,962 which is $322,626 in excess of the FY 1971 total reported in Table 1. This difference is due to the inclusion of additional projects in the School of Education. The values in Table 1 were not increased upon receipt of new data from the School, since Table 1 was designed to show trends and the data from the School were given on that basis.

been reported. For instance a report for the period July 1, 1968, through June 30, 1969, had indicated a total of "$18,098,249" for "research, training and equipment grants" in contrast to the $5,733,069 given in the current summary for this same period. The difference is the result of the interpretation of what is a more meaningful type of analysis. The larger value consists of the levels for grants active during the quoted period. Using this method, if a grant were awarded prior to July 1, 1968, and were still active during this period, the total funds would be included in the tabulation. The total funds would again be included in the following year, if the grant were still active. However, in the current report, levels are given on the basis of "new funds awarded" rather than upon grants that are "active". Thus, a two year NSF grant awarded in September 1968 for $20,000 is included only in FY 1969 calculations. In the case of true "continuation" awards, e.g. NIH grants, each "budget period" is included in the appropriate fiscal year during which the funds were received. In this way it is hoped that comparisons from one year to the next are more meaningful.

Data obtained from this process as well as from other sources within the University have been included in this report. However, an in-depth analysis has been excluded for such major elements as the School of Education and the College of Agriculture. A significant source of funds for agricultural research is derived from the U.S. Department of Agriculture. These funds have not been included in this report. On the other hand, individual grants and contracts from other sources for the support of research in the College of Agriculture have been included.

Table 4 presents data for individual grants and contracts according to the administrative unit receiving them. (Funds have not been included in the table for the "special project" awarded to the Department of Psychology.) As might be expected, the Faculty of Natural Sciences and Mathematics has re-

ceived the greatest proportion of funds for regular research projects--47.7% in the current fiscal year. (Although the partition of the College of Arts and Sciences did not occur until this year, the separation is made--for comparative purposes--for the preceeding two years as well.)

In order to give a more comprehensive comparison of the major administrative units of the University (college/school/faculty/independent department), Table 5 has been prepared to show the total funds received for all sponsored activities--with the exception of special funds received by the College of Agriculture from the U.S. Department of Agriculture. The data indicate that the Faculty of Natural Sciences and Mathematics accounts for 30.6% of the $9.66 million of support. The School of Education receives 22.6% of these funds and the Graduate School--through its interdisciplinary departments and institutional grants--accounts for 13.8% of the funding. Members of the Faculty of Social and Behavioral Sciences received 12.7% of the FY 1971 total reported support. In fiscal year 1971, no projects have been recorded for the Faculty of Arts and Humanities, the School of Home Economics or the School of Physical Education.

Faculty Research Grants and Faculty Growth Grants

Federal agencies and other outside agencies furnishing research support frequently concentrate on the "sciences". Yet, within a true University it is necessary to support the entire spectrum of research, scholarship and creative activities. Even in the sciences it is often necessary to provide minimal support for embryonic ideas prior to the time when the investigator can submit a proposal to an outside agency.

Although the University has no direct allocation from the Commonwealth for this support of research activities, funds derived from the University's trust fund are made available to support Faculty Research Grants and Faculty Growth Grants. Applications for Faculty Research Grants request seed money

for pilot studies which frequently lead to support from outside sources. Even in instances in which additional support is not forthcoming, the investment of the University's trust fund is of great benefit. Research can not be equated with its cost. In the areas of the arts and humanities, a relatively small level of funding can result in a productive advancement. The data of Table 6 indicate that the Faculty Research Grant Funds have received a wide distribution throughout the University.

During the current year, a total of $84,500 has been made available for Faculty Research Grants. The Faculty of Arts and Humanities has been awarded $22,008 from these funds (26.1%). The Faculty of Social and Behavioral Sciences has received $23,129 (27.4%) whereas the Faculty of Natural Sciences and Mathematics has obtained $13,457 (16.0%).

In 1970-71 a total of 164 faculty members from 48 departments or units within the University formally requested $110,341 from this account. During this period, 95% of those requesting funds received an award. The magnitude of the average grant was $540.00.

Faculty Research Grants are awarded for specific projects and specific budgetary needs. However, the advancement of scholarship also requires a more flexible support stimulus. Towards this end, Faculty Growth Grants are awarded. These $1,000 awards are for Summer fellowships which can be used by the recipient in a variety of ways to promote the Fellow's career development. For the Summer of 1971 a total of twenty-two such awards have been made to young Faculty members in the Departments of Art, Asian Studies, Comparative Literature, Economics, English, Fisheries, Geography, Germanic Languages, History, Linguistics, Mathematics, Philosophy and Romance Languages.

The review of Faculty Research Grants and Faculty Growth Grants is accomplished by the Research Council. This group has also been charged with the responsibility of making recommendations related to research policy.

During the past year, initial deliberations have been held concerning guidelines for the review of proposals and for broader topics as well. In the coming months, there is an expectation that written guidelines and recommendations will be formulated.

Special Projects and Future Plans

The interdependence of the University and the Federal Government in the conduct of research has required that the University community be continually aware of National priorities and Federal procedures. One of the major functions of the Office of the Coordinator of Research is to be cognizant of these areas and to inform the Faculty. In this way, the Faculty may focus its efforts towards education, service and research, its primary goals, rather than upon the need for personally following Washington's output of guidelines. Towards this end, this Office prepares a periodic Research Support Information Newsletter for distribution to Deans and to Department Heads and Chairmen. Individual consultation on research support affairs is also provided to the Faculty by the Associate Graduate Dean for Research.

During this past year, a renewed interest has occurred in the area of the protection of the rights and welfare of human subjects engaged in research studies. To assist the Faculty, a reconstituted University-wide Human Subjects Review Committee has been involved in the drafting of policy recommendations and guidelines. Their activities will be continued next year.

In order to assist the Faculty and the Administration in having current information regarding the submission and status of proposals sent to funding agencies, plans are being made to improve the data system used for this purpose. This reorganization will be continued next year.

With growth there is a need for organization. Growth without organization is likely to result in chaos. The University of Massachusetts is a growing institution. Its research activities are growing in pace with its

other commitments. As this University assumes its responsibility with its sister institutions in the advancement of knowledge, it, too, will share in a more complex organization. However, it is the intention of the Office of Research Affairs (nee Office of the Coordinator of Research) to help the Faculty in its research activities, rather than to erect administrative hurdles. It is in this way that we can all be about the University's functions in service, education and research.

Pat W. Camerino

Pat W. Camerino
Associate Graduate Dean
for Research

September 1971

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TABLE 1: Distribution by Type of Support for Sponsored Projects:

Category of Award	July 1, 1968-June 30, 1969			July 1, 1969-June 30, 1970			July 1, 1970-June 30, 1971		
	Number of Awards	Dollar Amount	% $ Amt.	Number of Awards	Dollar Amount	% $ Amt.	Number of Awards	Dollar Amount	% $ Amt.
Regular Research Projects	146	$3,915,423	68.2	175	$4,130,890	57.2	195	$5,015,442	53.7
Special Projects	0	-0-	.0	0	-0-	.0	1	582,000	6.2
Equipment Grants	6	78,910	1.4	1	20,600	.3	6	651,300	7.0
Training and Fellowship	8	154,825	2.7	30	1,017,910	14.1	24	660,346	7.0
Institutional Grants	3	905,335	15.8	3	735,565	10.2	3	586,074	6.2
Educational Projects	-	678,576	11.9	-	1,321,420	18.3	-	1,846,174	19.8
Total		$5,733,069	100.0		$7,226,385	100.1		$9,341,336	99.9

TABLE 2: Sources of Funds for the Sponsored Support of Regular Research Projects

Source of Support	July 1, 1968-June 30, 1969 Number of Awards	Total $ Amt.	% $ Amt.	July 1, 1969-June 30, 1970 Number of Awards	Total $ Amt.	% $ Amt.	July 1, 1970-June 30, 1971 Number of Awards	Total $ Amt.	% $ Amt.
Federal*	113	$3,683,072	94.1	118	$3,470,154	84.0	133	$4,438,456	88.5
NSF	34	933,600		36	1,066,900		43	1,454,862	
NIH	28	700,082		31	829,581		29	980,380	
NIMH	16	337,807		11	171,584		7	228,874	
Other D/HEW	0	-0-		4	37,057		7	239,473	
DOD	12	507,361		11	509,189		19	617,107	
NASA	6	258,300		10	254,766		9	251,285	
AEC	2	206,000		3	228,494		4	258,994	
Other Federal	15	739,922		12	372,583		15	407,481	
Commonwealth	2	30,000	.8	5	335,868	8.1	1	20,000	.4
Foundations	7	99,805	2.6	12	160,367	3.9	19	247,944	5.0
Industry/Industrial Foundations	16	53,339	1.4	32	136,871	3.3	27	136,416	2.7
Other	8	49,207	1.3	8	27,630	.7	15	172,626	3.5
TOTAL	146	$3,915,423	100.2	175	$4,130,890	100.0	195	$5,015,442	100.1

*The individual governmental agencies listed in the table are included in the "Federal" totals. These agencies are: NSF - National Science Foundation; NIH - National Institutes of Health; NIMH - National Institute of Mental Health; DOD - Department of Defense (Army, Air Force, Office of Naval Research, etc.); NASA - National Aeronautics and Space Administration; AEC - Atomic Energy Commission; other D/HEW - e.g. Health Services and Mental Health Administration; Office of Education.

TABLE 3: Distribution, by Source, of Support for Sponsored Activities:

July 1, 1970 - June 30, 1971 (Fiscal Year 1971)

Source of Support	Regular Research Projects	Training and Fellowships	Other	Total	% of Total
Federal	$4,438,456	$ 654,168	$2,974,874 (a,b,c,d)	$8,067,498	83.5
National Science Foundation	1,454,862	86,235	1,390,959 (a,b,d,)	2,932,056	
Health, Education, Welfare	1,448,727	473,445	1,539,315 (c,d)*	3,461,487	
Defense	617,107	47,896	-0-	665,003	
Other Federal	917,760	46,592	44,600 (c)	1,008,952	
Commonwealth	20,000	-0-	136,000 (c)	156,000	1.6
Foundations	247,944	6,178	238,000 (c)	492,122	5.1
Industry/Industrial Found.	136,416	-0-	1,000 (a)	137,416	1.4
Other	172,626	-0-	638,300 (c)	810,926	8.4
Total	$5,015,442	$ 660,346	$3,988,174	$9,663,962	100.0

(a) equipment grants; (b) special project; (c) educational projects; (d) institutional projects

*In this total of $1,539,315 for D/HEW, the Office of Education has funded the School of Education at a level of $1,111,900 for educational projects, including the Audio-Visual Center.

TABLE 4: Distribution, by Administrative Units, for Funds Received for Regular Research Projects*

Administrative Unit**	July 1, 1968-June 30, 1969 Number of Awards	July 1, 1968-June 30, 1969 Total $ Amt.	July 1, 1969-June 30, 1970 Number of Awards	July 1, 1969-June 30, 1970 Total $ Amt.	July 1, 1970-June 30, 1971 Number of Awards	July 1, 1970-June 30, 1971 Total $ Amt.
Arts and Humanities	1	$ 10,000	1	$ 12,420	0	-0-
Natural Sciences and Mathematics	66	2,033,239	79	2,207,607	84	$2,391,357
Social and Behavioral Sciences	13	262,483	19	312,450	16	445,306
Agriculture	40	518,325	46	539,548	57	699,862
Engineering	17	791,176	18	825,367	15	630,391
Business Administration	1	20,245	2	20,475	4	76,468
Physical Education	1	24,473	1	9,746	0	-0-
Public Health	1	5,577	2	7,600	2	117,893
Graduate School	6	249,905	7	195,677	17	654,165
TOTAL	146	$3,915,423	175	$4,130,890	195	$5,015,442

*"Regular Research Projects" include individual grants and contracts.

**The School of Education, the School of Home Economics and the School of Nursing have been omitted from this table since they did not receive any "regular research projects".

TABLE 5: Distribution, by Administrative Unit, of Support for Sponsored Activities:
July 1, 1970 - June 30, 1971 (Fiscal Year 1971)

Administrative Unit	Regular Research Projects	Training and Fellowships	Other	Total	% of Total
College of Agriculture	$ 699,862	$ 107,019	-0-	$ 806,881	8.3
Faculty of Arts & Humanities	-0-	-0-	-0-	-0-	0.0
Faculty of Natural Sciences/Math.	2,391,357	60,830	$ 509,500 (a)	2,961,687	30.6
Faculty of Social & Behavioral Sci.	445,306	198,267	582,000 (b)	1,225,573	12.7
School of Business Administration	76,468	-0-	-0-	76,468	0.8
School of Education*	-0-	-0-	2,168,800 (c)	2,168,800	22.6
School of Engineering	630,391	113,327	80,300 (a)	824,018	8.5
Graduate School	654,165	35,700	647,574 (a,d)	1,337,439	13.8
School of Home Economics	-0-	-0-	-0-	-0-	0.0
School of Nursing	-0-	72,723	-0-	72,723	0.7
School of Physical Education	-0-	-0-	-0-	-0-	0.0
Department of Public Health	117,893	72,480	-0-	190,373	2.0
Total	$5,015,442	$ 660,346	$3,988,174	$9,663,962	100.0

(a) equipment grants; (b) special project; (c) educational projects; (d) institutional grants

*In this tabulation, support for the Audio Visual Center has been included ($206,400) as well as other support received by the School of Education in FY 1972. The values reported here exceed those of Table 1 by $322,626.

TABLE 6: Faculty Research Grants - FY 1971

Administrative Unit	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
College of Agriculture	10	$ 5,554	8	$ 3,614
Faculty of Arts and Humanities	38	27,977	38	22,008
Faculty of Natural Sciences	26	15,769	25	13,457
Faculty of Social and Behavioral Sciences	43	27,807	41	23,129
School of Business Administration	9	8,830	9	5,000
School of Education	1	500	1	500
School of Engineering	13	6,300	12	3,900
Graduate School	9	5,550	8	4,723
School of Home Economics	2	1,950	2	960
School of Physical Education	4	2,849	4	1,369
Department of Public Health	3	1,250	3	1,250
Other Units*	6	6,005	5	4,590
TOTAL	164	$110,341	156	$84,500

*This includes the Counseling Center, Library, Health Service and Boston Campus. Funds are no longer allocated from this account for applications to Boston Faculty. The awarded total includes funds required to award certain applications approved prior to July 1, 1971.

APPENDICES

A Note on the Appendices

The source of the data for the listings has been the records maintained by the Office of the Coordinator of Research. Since it is possible that part of the pertinent information for the last three fiscal years was incomplete, this Office distributed preliminary listings in May 1971 to each Department Head/Chairman for verification. The returned listings were incorporated in the appendices. Slight changes were made for the purpose of consistency of reporting.

In order to furnish meaningful comparisons, these tables record new funds on an annual basis. Thus an NSF award for $20,000 made for two years with a beginning date in fiscal year 1970 is recorded only in the FY 1970 listing. We apologize to investigators with such awards if the appearance is given--by this method--that they do not have funds in FY 1971. If $20,000 were shown for both FY 1970 and FY 1971, the overall fiscal year totals would not show the funds received by the University during the fiscal year. At the same time a pro-ration of the funds for each year can not be done by this Office, since an investigator may not--in actuality--use a 50-50 pro-ration. On the other hand, if an award is divided into budget periods and new funds are awarded each year--as is the case with NIH awards--the funds for each budget period are listed in the corresponding fiscal year.

It is recognized that some awards are made to principal investigators and co-principal investigators. However, since the reporting of such co-principal investigators has not been consistent, no co-principal investigators have been included in these listings. Our apologies are again offered for such omissions and the resulting appearance that a Faculty member may not have a grant.

Although the reorganization of the College of Arts and Sciences into three Faculties did not occur until this last year, the Tables have been constructed using the new organization for the previous two years as well.

Individual listings have not been prepared for the School of Education, since prior to the Spring of 1971 not all of the proposals for its projects

were processed through the Office of the Coordinator of Research. The reported data have been obtained from Dean Roop's staff. The data given for the College of Agriculture exclude the "Hatch Act" funds and related support received by the College.

In trying to locate a specific reference in these listings the user should recognize that the following hierarchies have been used:

For Listing I - Regular Research Projects

Administrative Unit - summary page for each major unit

Department - separate pages for each department

Fiscal Year - FY 1969 first

Principal Investigator - alphabetically ordered

For Listing II - Regular Research Projects

Awarding Agency - separate pages for each major agency

Fiscal Year - FY 1971 first

Administrative Unit

Department

Principal Investigator - alphabetically ordered

For Listing III (Training and Fellowships) and Listing IV (Equipment Grants)

Fiscal Year - FY 1971 first

Administrative Unit

Department

Principal Investigator - alphabetically ordered

It is frequently difficult to categorize a sponsoring agency as a "Foundation" or an "Industry". In an attempt to ameliorate the problem, certain "Industrial Foundations" have been grouped with "Industry", since without the industry the corresponding "foundation" would not exist. Rather than devote a separate page

to each agency which funds a limited number of awards, a system of "index numbers" has been used for each major group of agencies. Individual readers may question the inclusions within a given category; however, the "raw data" should allow any re-grouping the reader may desire to make.

Recognizing the omissions as well as the potential corrections that need to be made in these tables, we hope, nevertheless, that these listings will give some reflection of the level of sponsored funding obtained by the Faculty at UMass/Amherst.

Finally, but by no means least, it should be noted that the recording of the data for these tables--along with their synthesis into these listings--has been the responsibility of Mrs. Linda McCarthy who has done a tremendous task under difficult circumstances. All that is right about this report is due to her efforts; I will take the blame for anything that is wrong.

Pat W. Camerino

Pat W. Camerino
Associate Graduate Dean for Research

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FACULTY OF ARTS AND HUMANITIES

DEPARTMENT	FY 1969 NO.	FY 1969 TOTAL COST	FY 1969 INDIRECT COST	FY 1970 NO.	FY 1970 TOTAL COST	FY 1970 INDIRECT COST	FY 1971 NO.	FY 1971 TOTAL COST	FY 1971 INDIRECT COST
English	1	$ 10,000	$ -0-	0	$ -0-	$ -0-	0	$ -0-	$ -0-
History	0	-0-	-0-	1	12,420	2,420	0	-0-	-0-
	1	$ 10,000	$ -0-	1	$ 12,420	$ 2,420	0	$ -0-	$ -0-

English

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
10/01/68	Copeland	Carnegie Corporation	$ 10,000	-

FY 70

	-	-	-	-

FY 71

	-	-	-	-

History

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
FY 69				
	-	-	-	-
FY 70				
06/01/70	Hanke	Nat'l. Endowment	$ 12,420	$ 2,420
FY 71				
	-	-	-	-

FACULTY OF NATURAL SCIENCES AND MATHEMATICS

DEPARTMENT	FY 1969 NO.	FY 1969 TOTAL COST	FY 1969 INDIRECT COST	FY 1970 NO.	FY 1970 TOTAL COST	FY 1970 INDIRECT COST	FY 1971 NO.	FY 1971 TOTAL COST	FY 1971 INDIRECT COST
Biochemistry	4	$ 103,012	$ 21,126	6	$ 146,100	$ 31,156	7	$ 158,315	$ 33,064
Botany	7	150,400	32,958	2	72,000	18,399	1	40,400	6,792
Chemistry	15	407,103	91,584	18	300,520	79,457	26	630,703	121,204
Geology/Geography	2	82,213	15,358	6	158,703	18,344	6	116,043	14,815
Mathematics/Statistics	2	23,700	3,947	9	128,900	35,769	5	79,800	21,725
Microbiology	9	193,472	45,568	7	147,847	37,548	6	97,822	22,370
Physics/Astronomy	18	748,000	187,900	22	930,600	222,100	24	971,300	212,950
Zoology	9	325,339	76,221	9	322,937	72,501	9	296,974	72,959
	66	$2,033,239	$474,662	79	$2,207,607	$515,274	84	$2,391,357	$505,879

Biochemistry

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
09/01/68	Gawienowski	Army	$ 45,132	$ 10,632
11/01/68	Parsons	NRC-Canada	462	-
04/01/69	Westhead	NIH	34,926	5,352
09/01/68	Westhead	NIH	22,492	5,142
		Subtotal	$ 103,012	$ 21,126

FY 70

05/01/70	Nordin	NASA	$ 30,000	$ 7,530
07/01/69	Nordin	Frasch Foundation	6,000	-
07/01/69	Parsons	Am. Cancer Soc.	50,140	8,798
09/01/69	Reid	Canada	5,000	-
09/01/69	Westhead	NIH	23,569	5,104
04/01/69	Westhead	NIH	31,391	9,724
		Subtotal	$ 146,100	$ 31,156

FY 71

05/01/71	Gawienowski	NIH	$ 41,494	$ 11,062
09/01/70	Nordin	NSF	28,000	3,168
07/01/70	Nordin	Frasch Foundation	8,000	-
07/01/70	Parsons	Canada	487	-
07/01/70	Parsons	Am. Cancer Soc.	8,356	-
09/01/70	Westhead	NIH	26,424	7,584
04/01/71	Westhead	NIH	45,554	11,250
		Subtotal	$ 158,315	$ 33,064

Botany

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
FY 69					
09/01/68	Ahmadjian	NSF		$ 31,700	$ 8,287
05/01/69	Bierhorst	NSF		14,300	3,118
09/01/68	Bigelow	NSF		18,700	4,724
06/01/69	Klekowski	NSF		26,200	6,177
09/01/68	Schuster	NSF		15,700	2,061
09/01/68	Schuster	NSF		24,800	4,571
09/01/68	Wilce	NSF		19,000	4,020
			Subtotal	$ 150,400	$ 32,958
FY 70					
09/15/69	Lockhart	NSF		$ 45,000	$ 10,912
09/15/69	Mulcahy	NSF		27,000	7,487
			Subtotal	$ 72,000	$ 18,399
FY 71					
11/01/70	Smith	NSF		$ 40,400	$ 6,792

Chemistry

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
05/01/69	Brandts	NIH	$ 51,942	$ 9,837
10/01/68	Brandts	Pet. Res. Fund	5,000	416
09/01/68	Carpino	NIH	22,380	5,930
04/01/69	Carpino	NSF	38,100	8,650
06/30/69	Holmes	Off. Saline Water	41,520	9,190
03/01/69	Holmes	NSF	38,500	9,393
08/01/68	McEwen	ACS	18,000	-
09/01/68	McEwen	NSF	35,100	9,376
09/01/68	McEwen	NIH	13,424	3,973
09/01/68	Rowell	NSF	12,300	2,934
06/15/69	Siggia	NSF	46,800	13,924
10/01/68	Stein	NSF	28,600	5,670
09/01/68	Stein	Pet. Res. Fund	24,000	2,001
03/01/69	Stein	NIH	19,920	5,670
01/01/69	Stengle	NIH	11,517	4,620
		Subtotal	$ 407,103	$ 91,584

FY 70

06/01/70	Archer	NSF	$ 21,000	$ 4,908
06/27/70	Archer	ACS	7,500	625
07/01/69	Barnes	Merck	5,000	-
05/01/70	Brandts	NIH	43,395	12,143
06/01/70	Cade	NSF	31,800	7,623
09/01/69	Carpino	NIH	23,676	5,676
09/16/69	Lilly	Sloan Foundation	16,100	2,100
06/01/70	MacKnight	NSF	29,100	8,300
06/01/70	MacKnight	Esso Foundation	2,500	-
09/01/69	McEwen	NIH	14,950	3,740
12/31/69	McEwen	Merck	1,000	-
08/01/69	McEwen	Monsanto	1,000	-
11/01/69	Rowell	NSF	35,000	6,148
09/01/69	Stidham	NSF	14,500	4,017
06/01/70	Stein	ONR	25,000	18,928
08/01/69	Stein	Monsanto	3,000	-
09/01/69	Stein	Gen. Tire Rubber	6,500	-
03/01/70	Stein	NIH	19,499	5,249
		Subtotal	$ 300,520	$ 79,457

Chemistry (Con't)

FY 71

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
06/01/71	Archer	NSF	$ 40,000	$ 10,340
09/01/70	Barnes	ACS	7,500	-
04/26/71	Barnes	NSF	63,500	2,880
05/01/71	Brandts	NIH	44,372	12,487
09/01/70	Carpino	Pet. Res. Fund	26,000	2,167
09/01/70	Carpino	NIH	24,638	5,995
09/01/70	Chien	ACS	20,000	1,139
08/01/70	Chien	NSF	24,000	6,023
05/01/71	Chien	NIH	18,736	4,932
10/01/70	Hixson	Res. Corp.	5,000	-
09/01/70	Hixson	Pet. Res. Fund	7,500	
02/01/70	Hixson	NSF	23,000	2,925
02/01/71	Holmes	NSF	16,800	4,320
08/01/70	Lillya	NSF	33,000	7,976
09/01/70	McEwen	NSF	46,100	12,082
09/01/70	Miller	NSF	13,000	3,575
09/01/70	Miller	ACS	7,560	630
09/01/70	Rausch	ACS	5,568	464
07/01/70	Rausch	Gulf	5,000	-
09/01/70	Rausch	NSF	56,400	14,027
06/01/71	Siggia	NSF	48,700	13,369
03/01/70	Stein	NIH	19,049	5,387
06/01/71	Stein	NSF	25,100	6,400
10/01/70	Stengle	AFOSR	10,000	2,420
09/01/70	Siggia	ACS	20,000	1,666
12/15/70	Zajicek	N. E. Res. Inc.	20,180	-
		Subtotal	$ 630,703	$ 121,204

Geology and Geography

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
04/01/69	Hayes	CERC		$ 12,324	$ 3,024
01/01/69	Hayes	ONR		69,889	12,334
			Subtotal	$ 82,213	$ 15,358

FY 70

04/01/70	Hayes	CERC		$ 9,281	$ 660
01/01/70	Hayes	ONR		89,123	5,720
04/04/70	Hayes	Army		32,562	5,632
04/01/70	McGill	NASA		6,508	1,805
04/01/70	McGill	NASA		16,229	4,149
03/01/70	Smith	NASA		5,000	378
			Subtotal	$ 158,703	$ 18,344

FY 71

02/01/71	Haggerty	NASA		$ 3,000	$ -
06/01/71	McGill	NASA		14,136	3,036
01/01/71	Hayes	ONR		57,869	2,396
05/15/71	Hayes	CERC		9,385	2,385
05/15/71	Hayes	CERC		9,485	2,385
01/01/71	Wise	Jet Prop. Lab.		22,168	4,613
			Subtotal	$ 116,043	$ 14,815

Mathematics and Statistics

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
07/01/68	Martindale	NSF		$ 11,700	$ 1,947
07/01/68	Schweizer	NSF		12,000	2,000
			Subtotal	$ 23,700	$ 3,947

FY 70

07/01/69	Becker	NSF		$ 9,600	$ 2,541
09/01/69	Chen	NSF		14,400	4,180
06/01/70	Hayes	NSF		7,000	1,830
06/15/70	Hertz	NSF		15,000	4,050
07/01/69	Hurt	NSF		5,400	1,260
06/15/70	Hurt	NSF		12,800	3,134
07/01/69	Janowitz	NSF		14,000	4,158
07/01/69	Mann	NSF		39,000	11,372
07/01/69	Martindale	NSF		11,700	3,244
			Subtotal	$ 128,900	$ 35,769

FY 71

07/01/70	Becker	NSF		$ 10,800	$ 2,788
07/01/70	Broshi	NSF		8,700	2,180
06/01/71	Hayes	NSF		7,000	1,915
07/01/70	Mann	NSF		39,000	11,014
07/01/70	Schweizer	NSF		14,300	3,828
			Subtotal	$ 79,800	$ 21,725

Microbiology

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
01/01/69	Canale	NIH	$ 11,415	$ 3,270
12/01/68	Cox	NIH	22,304	5,610
11/01/69	Dowell	NSF	15,000	2,354
09/01/68	Holt	NIH	21,182	5,268
06/01/69	Lessie	NIH	12,634	4,054
03/01/68	Lessie	NSF	34,400	4,918
06/01/69	Mortlock	NIH	18,240	4,888
06/01/69	Pfau	NIH	30,223	6,473
01/01/69	Thorne	NIH	28,074	8,733
		Subtotal	$ 193,472	$ 45,568

FY 70

01/01/70	Canale	NIH	$ 15,740	$ 4,001
12/01/69	Cox	NIH	23,230	6,402
06/01/70	Lessie	NIH	19,371	5,280
06/01/70	Mortlock	NIH	17,768	4,820
06/01/70	Pfau	NIH	28,728	6,255
01/01/70	Thorne	NIH	33,753	9,583
06/01/70	Wilder	ACS	9,257	1,207
		Subtotal	$ 147,847	$ 37,548

FY 71

01/01/71	Canale	NIH	$ 16,231	$ 4,486
12/01/70	Cox	NIH	24,481	6,811
07/01/70	Holt	Pittsfield Anti T.B. Assoc.	11,550	-
11/01/70	Holt	Lilly	4,000	
06/01/71	Lessie	NIH	22,628	5,918
06/01/71	Mortlock	NIH	18,932	5,155
		Subtotal	$ 97,822	$ 22,370

Physics and Astronomy

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
12/01/68	Ford	NSF	$ 17,200	$ 4,000
09/01/68	Harkness	NASA	100,000	29,500
06/01/69	Hoffman	AEC	36,000	4,500
06/25/69	Huguenin	NASA	24,500	6,600
01/15/69	Huguenin	NSF	25,000	6,900
03/15/69	Irvine	NSF	20,000	5,300
03/01/69	Krotkov	NSF	48,600	10,600
04/01/69	Mullin	ONR	19,400	5,700
10/01/68	Sastry	Army	23,100	3,900
01/01/69	Shafer	AEC	170,000	41,600
06/15/69	Soltysik	AFOSR	30,400	7,700
10/01/68	Sternheim	NSF	11,300	3,200
11/01/68	Strong	AFOSR	20,200	6,100
01/01/69	Strong	ESSA	34,700	9,100
01/01/69	Strong	NASA	17,100	5,100
01/01/69	Strong	NASA	7,400	2,200
09/01/68	Strong	NASA	101,300	23,800
07/01/68	Strong	ONR	41,800	12,100
		Subtotal	$ 748,000	$ 187,900

FY 70

12/01/69	Arny	NSF	$ 20,800	$ 4,600
10/01/69	Brehm	NSF	111,000	31,600
08/15/69	Dent	NSF	59,700	14,900
01/15/70	Ford	NSF	18,200	4,100
03/01/70	Goldenberg	Air Force	10,000	3,100
09/01/69	Goldenberg	NSF	28,900	900
05/05/70	Guyer	A. P. Sloan	6,500	1,000
09/01/69	Harkness	NASA	60,000	16,000
01/01/70	Harrison	NSF	35,900	9,300
06/01/70	Hoffman	AEC	37,000	5,100
06/25/70	Huguenin	NASA	25,000	6,800
01/15/70	Huguenin	NSF	92,100	22,900
09/01/69	Jones	NSF	39,900	9,400

Physics and Astronomy (Cont'd)

FY 70 (Cont'd)

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
06/01/70	Peterson	NSF	$ 13,700	$ 3,400
01/01/70	Shafer	AEC	170,000	42,200
12/01/69	Sternheim	NSF	25,400	7,100
02/01/70	Strong	AFOSR	14,700	3,600
03/10/70	Strong	ESSA	30,000	7,500
05/26/70	Strong	ESSA	7,500	-
09/01/69	Strong	NASA	66,500	15,700
09/01/69	Strong	NASA	17,100	2,900
07/01/69	Strong	ONR	40,700	10,000
		Subtotal	$ 930,600	$ 222,100

FY 71

07/01/70	Engelsberg	NSF	$ 36,800	$ 9,300
08/01/70	Ford	NSF	17,400	3,400
04/01/71	Ford	NSF	35,900	8,700
06/01/71	Gerace	NSF	50,000	14,000
09/01/70	Gluckstern	NSF	26,900	7,300
05/15/71	Goldenberg	NSF	16,300	2,850
03/01/71	Goldenberg	NSF	20,000	4,600
03/01/71	Goldenberg	Air Force	1,000	300
09/01/70	Harkness	NASA	60,000	14,000
10/01/70	Harkness	NASA	50,000	7,600
06/01/71	Hoffman	AEC	39,500	8,100
10/01/70	Huguenin	Research Corporation	73,000	-
04/01/71	Huguenin	NSF	90,100	25,800
11/15/70	Irvine	NSF	10,000	2,500
09/01/70	Irvine	NASA	37,700	9,800
07/01/70	Penchina	NSF	57,900	14,700
06/01/71	Peterson	NSF	19,400	4,600
07/01/70	Sastry	Army	1,800	-
01/01/71	Shafer	AEC	160,000	39,300
07/01/70	Strong	ARPA	59,900	12,500
09/01/70	Strong	NASA	33,200	6,100
09/01/70	Strong	NASA	16,800	3,700
09/01/70	Strong	NASA	17,000	3,700
07/15/70	Strong	ONR	40,700	10,100
		Subtotal	$ 971,300	$ 212,950

Zoology

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
09/01/68	Anderson	NIH		$ 27,898	$ 4,660
11/01/68	Fairbairn	NIH		52,612	11,879
06/01/69	Honigberg	NIH		53,015	14,135
06/01/69	Kato	NSF		39,900	8,961
02/01/69	Kaulenas	NSF		30,100	7,246
09/01/68	Rauch	NIH		40,098	10,098
09/01/68	Roberts, J. L.	NSF		30,500	5,066
05/01/69	Roberts, L. S.	NIH		22,009	7,489
01/01/69	Snedecor	NIH		29,207	6,687
			Subtotal	$ 325,339	$ 76,221

FY 70

01/01/70	Anderson	NIH		$ 47,671	$ 10,736
11/01/69	Fairbairn	NIH		49,262	11,704
06/01/70	Honigberg	NIH		55,172	14,651
02/01/70	Potswald	NSF		28,000	4,800
09/01/69	Rauch	NIH		42,609	10,706
05/01/70	Roberts, L. S.	NIH		25,811	7,040
01/01/70	Snedecor	NIH		21,969	3,336
11/01/69	Snyder	AEC		18,494	5,040
10/01/69	Wyse	NIH		33,949	4,488
			Subtotal	$ 322,937	$ 72,501

FY 71

01/01/71	Anderson	NIH		$ 40,396	$ 9,346
11/01/70	Fairbairn	NIH		52,089	13,244
06/01/71	Honigberg	NIH		50,935	14,168
04/01/71	Kaulenas	NSF		20,000	2,250
09/01/70	Rauch	NIH		46,855	12,173
05/01/71	Roberts	NIH		24,962	7,662
01/01/71	Snedecor	NIH		22,402	5,654
11/01/70	Snyder	AEC		18,494	4,442
10/01/70	Wyse	NIH		20,841	4,020
			Subtotal	$ 296,974	$ 72,959

FACULTY OF SOCIAL AND BEHAVIORAL SCIENCES

DEPARTMENT	FY 1969 NO.	FY 1969 TOTAL COST	FY 1969 INDIRECT COST	FY 1970 NO.	FY 1970 TOTAL COST	FY 1970 INDIRECT COST	FY 1971 NO.	FY 1971 TOTAL COST	FY 1971 INDIRECT COST
Anthropology	1	$ 6,226	$ 1,841	1	$ 4,390	$ 185	0	$ -0-	$ -0-
Economics	2	41,700	10,333	0	-0-	-0-	2	56,862	16,230
Government	0	-0-	-0-	4	33,130	-0-	3	113,106	18,904
Psychology	7	150,152	38,241	12	211,873	50,161	9	249,244	61,326
Sociology	3	64,405	-0-	2	63,057	11,660	2	26,094	6,288
	13	$ 262,483	$ 50,415	19	$ 312,450	$ 62,006	16	$ 445,306	$102,748

Anthropology

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
FY 69				
06/01/69	Salzmann	NIMH	$ 6,226	$ 1,841
FY 70				
06/22/70	Pi-Sunyer	NIMH	$ 4,390	$ 185
FY 71				
	-	-	-	-

Economics

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
12/01/68	Barkin	Labor		$ 10,800	$ 800
06/01/69	Smith	NSF		30,900	9,533
			Subtotal	$ 41,700	$ 10,333

FY 70

	-	-		-	-

FY 71

01/01/71	Muench	NSF		$ 15,762	$ 4,274
02/01/71	Sonnenschein	NSF		41,100	11,956
			Subtotal	$ 56,862	$ 16,230

Government

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
	-	-	-	-

FY 70

01/01/70	Booth	C. E. Merrill Trust	$ 22,500	$ -
07/01/69	Gere	Northeastern Univ.	3,000	-
08/01/69	Howards	Mass. Selectmen's Assoc.	5,100	-
07/01/69	Howards	Am. Pol. Sci. Assoc.	2,530	-
		Subtotal	$ 33,130	-

FY 71

07/01/70	Howards	Mass. Selectmen's Assoc.	$ 100	$ -
10/01/70	Howards	Off. Water Resources	41,500	-
06/15/71	Howards	Social Security Admin.	71,506	18,904
		Subtotal	$ 113,106	$ 18,904

Psychology

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
06/01/69	Clifton	NIMH		$ 18,676	$ 3,685
09/01/68	Epstein	NIMH		35,638	10,795
05/01/69	Levinger	NIH		16,519	4,819
05/01/69	Moore	NSF		15,700	3,350
06/01/69	Myers	NIMH		20,452	6,108
02/01/69	Trowill	NIMH		16,398	4,628
05/01/69	Weiss	NIH		26,769	4,856
			Subtotal	$ 150,152	$ 38,241

FY 70

05/01/70	Ayres	NIMH		$ 5,976	$ 1,298
09/01/69	Berger	NSF		40,700	11,989
06/01/70	Clifton, C.	NIMH		18,976	4,426
09/01/69	Clifton, R.	NIMH		5,926	926
01/01/70	Daehler	NIMH		6,706	1,716
09/01/69	Donahoe	NIMH		22,153	5,368
09/01/69	Epstein	NIMH		60,752	12,513
06/01/70	Himmelfarb	NIMH		7,090	2,090
02/01/70	Krieckhaus	NIMH		6,991	1,991
05/01/70	Levinger	NIH		25,503	6,998
06/01/70	Phillips	OE		6,100	846
06/01/70	Watt	OE		5,000	-
			Subtotal	$ 211,873	$ 50,161

FY 71

06/15/71	Anderson	OE		$ 25,717	$ 6,030
03/15/71	Danielson	NSF		27,700	6,165
09/01/70	Donahoe	NIMH		20,694	5,254
10/15/70	Emrick	OE		8,425	2,200
09/01/70	Epstein	NIMH		46,932	14,105
09/01/70	Moore	NSF		38,700	10,296
06/28/71	Myers	OE		53,702	11,952
09/01/70	Steiner	NIMH		18,874	5,324
08/01/70	Watt	N Assoc. MH		8,500	-
			Subtotal	$ 249,244	$ 61,326

SPECIAL

04/01/71	Louttit	NSF		$ 582,000	-

Sociology

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
12/01/68	Lee	C. of Mass.	$ 10,000	$ -
04/01/69	Lee	N.E. Bd. of Higher Ed.	20,000	-
03/01/69	Wilkinson	Med. Care & Ed. Found.	34,405	-
		Subtotal	$ 64,405	$ -

FY 70

07/01/69	Lee	NIH	$ 46,600	$ 11,660
07/01/69	Wilkinson	Med. Care & Ed. Found.	16,457	-
		Subtotal	$ 63,057	$ 11,660

FY 71

06/28/71	Sutton	OE	$ 10,000	$ 2,714
10/15/70	Yaukey	NIH	16,094	3,574
		Subtotal	$ 26,094	$ 6,288

COLLEGE OF AGRICULTURE

DEPARTMENT	FY 1969 NO.	FY 1969 TOTAL COST	FY 1969 INDIRECT COST	FY 1970 NO.	FY 1970 TOTAL COST	FY 1970 INDIRECT COST	FY 1971 NO.	FY 1971 TOTAL COST	FY 1971 INDIRECT COST
Agricultural Engr.	0	$ -0-	-0-	1	$ 15,000	$ 3,965	3	$ 20,076	-0-
Agri./Food Economics	0	-0-	-0-	0	-0-	-0-	4	112,800	-0-
Cranberry Station	5	20,300	3,780	4	1,750	-0-	5	33,560	4,620
Entomology	1	3,000	-0-	0	-0-	-0-	1	100	-0-
Environmental Sciences	5	85,778	24,493	2	48,683	10,868	4	29,006	6,870
Food Science & Tech.	8	140,964	25,785	8	114,055	13,449	8	151,830	24,560
Forestry & Wild. Mgt.	5	112,050	5,805	6	123,198	1,540	8	90,300	-0-
Land. Arch. & Reg. Plan.	0	-0-	-0-	0	-0-	-0-	1	3,000	-0-
Plant and Soil Sci.	9	60,500	5,000	8	82,468	10,143	8	109,739	14,524
Veterinary/Animal Sci.	6	79,334	13,259	12	104,226	18,891	9	71,582	7,942
Waltham Field Station	1	16,399	5,049	5	50,168	6,348	6	77,869	11,821
	40	$ 518,325	$ 83,171	46	$ 539,548	$ 65,204	57	$ 699,862	$ 70,337

Agricultural Engineering

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
	-	-	-	-
FY 70				
04/01/70	Rha	NSF	$ 15,000	$ 3,965
FY 71				
07/01/70	Clayton	Towns of Marion, Mattapoisett and Wareham, Massachusetts	$ 8,560	-
08/01/70	Clayton	U. S. Treasury	10,400	
07/01/70	Clayton	Agway, Inc.	1,116	
		Subtotal	$ 20,076	

Agricultural and Food Economics

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
	-	-	-	-

FY 70

	-	-	-	-

FY 71

04/05/71	Christensen	U.S.D.A.	$ 3,000	-
08/01/70	Crossmon	Connecticut	56,800	-
10/01/70	Leed	Food Mart, Inc.	3,000	-
07/01/70	Wyckoff	Off. Water Resources	50,000	-
		Subtotal	$ 112,800	

Cranberry Station

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
06/01/69	Cross	Chevron Oil	$ 500	$ -
06/01/69	Deubert	Aquacultural Res. Corp.	2,000	-
05/01/69	Devlin	HSMHA	17,200	3,780
06/01/69	Tomlinson	Shell Oil	500	-
11/01/68	Zuckerman	R. T. Vanderbilt Co.	100	-
		Subtotal	$ 20,300	$ 3,780

FY 70

04/01/70	Cross	Uniroyal	$ 500	$ -
04/01/70	Demoranville	Monsanto	500	-
07/01/69	Devlin	Agway	650	-
04/01/70	Zuckerman	Vanderbilt	100	-
		Subtotal	$ 1,750	$ -

FY 71

07/01/70	Cross	Cape Cod Cranberry	$ 200	$ -
01/01/71	Cross	Ocean Spray	18,000	-
07/01/70	Demoranville	Chemagro	300	-
07/01/70	Deubert	Marine Res. Fdn., Inc.	100	-
11/01/70	Devlin	HSMHA	14,960	4,620
		Subtotal	$ 33,560	$ 4,620

Entomology

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
06/01/69	Shaw	Shell Oil	$ 3,000	$ -

FY 70

	-	-	-	-

FY 71

07/01/70	Lilly	Berg Exterminating	$ 100	-

Environmental Sciences

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
FY 69				
09/01/68	Gunner	HSMHA	$ 26,563	$ 8,207
05/01/69	Litsky	Fed. Water Poll. Control Admin.	29,515	11,134
06/01/69	Litsky	Kimberly Clark	8,500	-
05/01/69	Walker	NIH	14,300	4,252
05/09/69	Walker	Mass. TB and Health League	6,900	900
		Subtotal	$ 85,778	$ 24,493
FY 70				
05/01/70	Litsky	Fed. Water Poll. Control Admin.	$ 27,436	$ 6,820
05/01/70	Walker	NIH	21,247	4,048
		Subtotal	$ 48,683	$ 10,868
FY 71				
03/01/71	Litsky	Glycerine Prod. Assoc.	$ 3,700	$ -
12/02/70	Litsky	EPA	6,767	2,100
09/01/70	Walker	Mass. TB and Res. Dis.	3,450	450
05/01/71	Walker	NIH	15,089	4,320
		Subtotal	$ 29,006	$ 6,870

Food Science and Technology

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
06/01/69	Esselen	HSMHA	$ 25,000	$ -
01/01/69	Esselen	Glass Container	14,000	-
02/01/69	Francis	HSMHA	17,547	5,197
09/01/68	Francis	Ocean Spray Cranberry	10,000	-
05/01/69	Hultin	NIH	21,137	5,817
06/01/69	Levin	HSMHA	16,761	4,961
01/01/69	Nawar	HSMHA	11,360	1,920
03/01/69	Stumbo	HSMHA	25,159	7,890
		Subtotal	$ 140,964	$ 25,785

FY 70

01/01/70	Esselen	Glass Container	$ 14,000	$ -
08/01/69	Esselen	Beech Nut	6,000	-
09/01/69	Esselen	Heublein, Inc.	24,000	-
06/30/70	Francis	Hunter Assoc. Lab., Inc.	6,000	-
09/01/69	Francis	Ocean Spray Cranberry	10,000	-
05/01/70	Hultin	NIH	20,275	4,869
06/01/70	Levin	NIH	15,780	4,620
01/01/70	Nawar	NIH	18,000	3,960
		Subtotal	$ 114,055	$ 13,449

FY 71

07/01/70	Esselen	Beech Nut	$ 6,000	-
01/01/71	Esselen	Glass Container	14,000	-
07/01/70	Esselen	Heublein	24,000	-
09/01/70	Francis	Ocean Spray Cranberry	5,000	-
06/01/71	Hultin	NSF	44,000	9,750
10/15/70	Hultin	NSF	20,000	5,280
06/01/71	Levin	NIH	17,830	5,130
01/01/71	Nawar	NIH	21,000	4,400
		Subtotal	$ 151,830	$ 24,560

Forestry and Wildlife Management

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
07/01/68	Carlozzi	Off. of Water Resources	$ 63,250	$ -
05/01/69	McCann	U.S. Bureau of Sport Fish.	4,500	-
08/01/68	McCann	C. of Mass.	20,000	-
06/01/69	MacConnell	Geigy	1,000	-
09/01/68	Wilson	NSF	23,300	5,805
		Subtotal	$ 112,050	$ 5,805

FY 70

07/01/69	Carlozzi	Off. of Water Resources	$ 27,300	$ -
08/30/69	Cole	Fed. Water Poll. Control Admin.	6,840	1,540
07/01/69	Hoadley	Independent Nail	2,410	-
07/01/69	Larson	Off. of Water Resources	61,888	-
05/01/70	McCann	Sport Fisheries Wildlife Ser.	4,760	-
08/01/69	McCann	C. of Mass.	20,000	-
		Subtotal	$ 123,198	$ 1,540

FY 71

06/01/70	Gatslick	N. E. Regional Comm.	$ 10,000	-
05/01/71	Larson	Mass. Water Res. Comm.	17,800	-
08/01/70	McCann	C. of Mass.	20,000	-
01/26/71	McCann	Con. Edison	1,500	-
05/01/71	McCann	Mass. Water Res. Comm.	8,000	-
03/01/71	Rhodes	Dept. of Agri.	18,000	-
03/01/71	Rhodes	Dept. of Agri.	9,900	-
07/01/70	Rice	U.S.D.A.	5,100	-
		Subtotal	$ 90,300	$ -

Landscape Architecture and Regional Planning

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
FY 69				
	-	-	-	-
FY 70				
	-	-	-	-
FY 71				
03/01/71	Zube	U.S.D.A.	$ 3,000	-

Plant and Soil Science

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
09/01/68	Drake	Gulf Oil Corp.	$ 5,000	$ -
06/01/69	Havis	Mass. Nurs. Assoc	1,000	-
03/01/69	Havis	T-H Chem. Co.	500	-
03/01/69	Lord	Chevron Chem. Co.	500	-
04/01/69	Southwick	Mass. Fruit Growers Assoc.	500	-
04/01/69	Southwick	Uniroyal	1,000	-
07/01/68	Thomson	J. E. Cain Co.	1,500	-
04/01/69	Troll	Mass. Colf Assoc.	500	-
01/01/69	Zak	Mass. Dept. Public Works and U.S. Bureau of Public Roads	50,000	5,000
		Subtotal	$ 60,500	$ 5,000

FY 70

07/01/70	Barker	Agway, Inc.	$ 5,000	-
06/01/70	Barker	NIH	23,868	5,143
10/01/69	Bramlage	Monsanto Co.	100	-
07/01/69	Lord	T-H Chem. Co.	500	-
04/01/70	Southwick	Uniroyal	1,000	-
07/01/69	Thomson	J. E. Cain Co.	1,500	-
07/01/69	Vengris	Shell Chem. Co.	500	-
01/01/70	Zak	Mass. Dept. Public Works and U.S. Bureau of Public Roads	50,000	5,000
		Subtotal	$ 82,468	$ 10,143

FY 71

07/01/70	Barker	Agway, Inc.	$ 5,000	$ -
06/01/71	Barker	PHS	30,789	7,524
05/01/71	Barker	Oxford Pickle Co.	1,000	-
10/01/70	Bramlage	Monsanto Co.	150	-
04/01/71	Southwick	Uniroyal	500	-
07/01/70	Thomson	J. E. Cain Co.	1,500	-
07/01/70	Troll	Amer. Metal Chem., Inc.	800	-
01/01/71	Zak	Mass. Dept. Public Works and U.S. Bureau of Public Roads	70,000	7,000
		Subtotal	$ 109,739	$ 14,524

Veterinary and Animal Science

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
01/01/69	Fox	U.S.D.A.	$ 8,500	$ -
02/01/69	Fox	Nat'l. Broiler Council	5,500	-
12/01/68	Gaunt	Agway, Inc.	5,000	-
10/01/68	Howe	NIH	9,581	1,737
11/01/68	Howe	ONR	16,953	2,289
05/01/69	Snoeyenbos	HSMHA	33,800	9,293
		Subtotal	$ 79,334	$ 13,259

FY 70

09/01/69	Black	NIH	$ 14,955	$ 2,835
06/20/70	Black	NIH	14,840	2,640
07/01/69	Fox	Agway, Inc.	2,000	-
07/01/69	Fox	Agway, Inc.	2,650	-
08/01/69	Fox	Borden Chem.	4,596	-
09/01/69	Fox	Holly Farms Co.	6,000	-
07/01/69	Fox	Salisbury Ind.	5,500	-
07/01/69	Gaunt	Eastern Artif. Insem.	1,965	-
10/01/69	Howe	NIH	12,934	2,684
09/01/69	Smith	HSMHA	9,529	2,860
05/01/70	Snoeyenbos	FDA	20,757	7,872
05/01/70	Southwick	Amer. Feed Mfgs.	8,500	-
		Subtotal	$ 104,226	$ 18,891

FY 71

06/20/71	Black	NIH	$ 13,850	$ 2,700
06/01/71	Duby	Population Council	9,600	710
02/01/71	Fox	Upjohn Co.	3,000	-
10/01/70	Fox	Agway	2,850	-
08/01/70	Fox	Pilch-DeKalb	7,500	-
08/01/70	Gaunt	Eastern Art. Insem.	1,000	-
10/01/70	Howe	NIH	13,372	2,772
04/15/71	Howe	ONR	10,410	1,760
10/01/70	Nobel	Arthritis Foundation	10,000	-
		Subtotal	$ 71,582	$ 7,942

Waltham Field Station

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
FY 69				
06/30/69	Feder	HSMHA	$ 16,399	$ 5,049
FY 70				
10/01/69	Galinat	NSF	$ 28,300	5,460
07/01/69	Naegele	SUNY	300	-
08/01/69	Naegele	Ma. Soc. Prom. Ag.	3,500	-
01/01/70	Naegele	C. Mass - BHE	17,568	888
06/01/70	Naegele	Geigy Chem. Corp.	500	-
		Subtotal	$ 50,168	$ 6,348
FY 71				
07/01/70	Feder	HSMHA	$ 40,516	$ 6,506
06/01/71	Feder	Nat'l. Air Poll. Control Admin.	19,926	2,543
07/01/70	Naegele	Ma. Flower Growers	963	-
07/01/70	Naegele	Ford Motor Co.	1,000	-
10/01/70	Naegele	N. E. Veg. Growers	500	-
04/15/71	Naegele	EPA	14,964	2,772
		Subtotal	$ 77,869	$ 11,821

SCHOOL OF ENGINEERING

DEPARTMENT	FY 1969 NO.	FY 1969 TOTAL COST	FY 1969 INDIRECT COST	FY 1970 NO.	FY 1970 TOTAL COST	FY 1970 INDIRECT COST	FY 1971 NO.	FY 1971 TOTAL COST	FY 1971 INDIRECT COST
Chemical	4	$ 148,908	$ 28,835	3	$ 96,259	$ 25,647	5	$ 156,623	$ 30,893
Civil	6	261,017	22,276	5	324,294	4,814	0	-0-	-0-
Electrical	5	95,631	27,229	3	41,884	15,055	7	255,335	71,117
Industrial	0	-0-	-0-	0	-0-	-0-	1	14,700	-0-
Mechanical/Aerospace	0	-0-	-0-	6	182,930	45,847	1	43,733	9,945
Other	2	285,620	64,618	1	180,000	47,007	1	160,000	34,635
	17	$ 791,176	$142,958	18	$ 825,367	$138,370	15	$ 630,391	$146,590

Chemical Engineering

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
09/15/68	Douglas	NSF	$ 57,600	$ 13,495
06/01/69	Lindsey	Fed. Water Poll. Control Admin.	33,000	-
12/01/68	Roblee	ONR	13,257	3,997
02/01/69	Short	HSMHA	45,051	11,345
		Subtotal	$ 148,908	$ 28,835

FY 70

01/15/70	Lenz	NSF	$ 41,000	$ 10,835
06/01/70	Lindsey	Fed. Water Poll. Control Admin.	32,164	7,788
02/01/70	Short	HSMHA	23,095	7,024
		Subtotal	$ 96,259	$ 25,647

FY 71

06/01/71	Kittrell	PHS	$ 39,334	$ 5,816
02/01/71	Short	HSMHA	43,165	11,790
03/01/71	Vanpee	Dept. Interior	24,924	4,224
05/01/71	Vanpee	Air Force	6,000	900
05/01/71	Vanpee	NSF	43,200	8,163
		Subtotal	$ 156,623	$ 30,893

Civil Engineering

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
07/01/68	Adrian	Off. Water Resources	$ 129,580	$ -
06/01/69	Adrian	Fed. Water Poll. Cont. Admin.	60,177	15,947
06/01/69	Chajes	United Engin. Trustees	1,000	-
02/01/69	Heronemus	Link Foundation	1,500	-
07/01/68	Higgins	Off. Water Resources	38,600	-
06/01/69	Skrinde	Fed. Water Poll. Cont. Admin.	30,160	6,329
		Subtotal	$ 261,017	$ 22,276

FY 70

06/01/70	Bemben	Navy	$ 24,994	$ 4,814
09/01/69	Chajes	Column Res. Council	1,000	-
12/01/69	DiGiano	C. of Mass.	108,550	-
12/01/69	Feng	C. of Mass.	129,850	-
12/01/69	Kuzminski	C. of Mass.	59,900	-
		Subtotal	$ 324,294	$ 4,814

FY 71

	-	-	-	-

Electrical Engineering

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
04/01/69	Jackson	NSF		$ 15,000	$ 4,400
02/01/69	McIntosh	Air Force		34,906	10,302
04/01/69	McIntosh	NSF		15,000	4,253
02/01/69	Monopoli	NASA		8,000	2,179
05/01/69	Thomas	NIH		22,725	6,095
			Subtotal	$ 95,631	$ 27,229

FY 70

12/01/69	McIntosh	Army		$ 9,899	$ 2,134
02/01/70	Monopoli	NASA		13,429	5,271
05/01/70	Thomas	NIH		18,556	7,650
				$ 41,884	$ 15,055

FY 71

06/01/71	Franks	Air Force		$ 26,350	$ 7,200
12/01/70	McIntosh	Army		15,645	4,400
02/01/71	McIntosh	Air Force		20,366	5,016
02/01/71	Monopoli	NASA		19,449	5,500
06/01/71	Navon	Army		26,300	6,650
05/01/71	Thomas	NIH		95,025	36,200
03/01/71	Yngvesson	NSF		52,200	6,151
			Subtotal	$ 255,335	$ 71,117

Industrial Engineering

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
	-	-	-	-

FY 70

	-	-	-	-

FY 71

09/01/70	Rising	Albany Med.	$ 14,700	-

Mechanical and Aerospace Engineering

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
	-	-		-	-

FY 70

06/01/70	Boothroyd	NSF		$ 50,100	$ 13,024
04/01/70	Goss	NSF		15,000	4,585
04/01/70	Kirchoff	NSF		14,900	4,488
04/01/70	Mani	NSF		15,000	4,600
06/01/70	Mani	NASA		15,000	3,470
05/01/70	Poli	Army		72,930	15,680
			Subtotal	$ 182,930	$ 45,847

FY 71

03/01/71	McGowan	HSMHA		$ 43,733	$ 9,945

Other Engineering

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
09/01/68	Picha	ONR	$ 180,000	$ 44,030
07/01/68	Segool	U.S. Dept. of Commerce	105,620	20,588
		Subtotal	$ 285,620	$ 64,618

FY 70

09/01/69	Picha	ONR	$ 180,000	$ 47,007

FY 71

09/01/70	Picha	ONR	$ 160,000	$ 34,635

OTHER ADMINISTRATIVE UNITS

SCHOOL/DEPARTMENT	FY 1969 NO.	FY 1969 TOTAL COST	FY 1969 INDIRECT COST	FY 1970 NO.	FY 1970 TOTAL COST	FY 1970 INDIRECT COST	FY 1971 NO.	FY 1971 TOTAL COST	FY 1971 INDIRECT COST
SCHOOL OF BUSINESS ADMINISTRATION	1	$ 20,245	-0-	2	$ 20,475	$ 1,397	4	$ 76,468	$ 16,572
SCHOOL OF EDUCATION	N.A.	$ 678,576	N.A.	N.A.	$1,321,420	N.A.	N.A.	$1,846,174	N.A.
SCHOOL OF PHYSICAL EDUCATION	1	$ 24,473	$ 5,073	1	$ 9,746	$ 1,271	0	-0-	-0-
DEPARTMENT OF PUBLIC HEALTH	1	$ 5,577	$ 581	2	$ 7,600	$ 1,892	2	$ 117,893	$ 15,475
GRADUATE SCHOOL									
Computer Sciences	1	$ 53,000	$ 13,333	0	$ -0-	$ -0-	4	$ 119,647	$ 27,003
Marine Science	0	-0-	-0-	0	-0-	-0-	3	165,300	34,264
Polymer Sci/Engr	4	96,905	22,148	6	95,677	19,454	8	239,218	56,433
Water Resources	1	100,000	-0-	1	100,000	-0-	2	130,000	-0-
	6	$ 249,905	$ 35,481	7	$ 195,677	$ 19,454	17	$ 654,165	$117,700

School of Business Administration

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
02/01/69	McGarrah	Lower Pioneer Valley Reg. Plan. Comm.	$ 20,245	$ -

FY 70

06/01/70	Johnson, L. A.	D. Comm.	$ 15,275	$ -
06/15/70	Singer	OE	5,200	1,397
		Subtotal	$ 20,475	$ 1,397

FY 71

10/15/70	Balintfy	ONR	$ 59,000	$ 16,572
10/01/70	McGarrah	Springfield Ch. Comm.	14,223	-
02/01/71	McGarrah	Springfield Model Cities	1,818	-
07/01/70	Venkatesan	Consumer Res. Inst.	1,427	
		Subtotal	$ 76,468	$ 16,572

School of Physical Education

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
FY 69				
05/01/69	Kroll	NIH	$ 24,473	$ 5,073
FY 70				
01/01/70	Edington	Mass. Heart	$ 9,746	$ 1,271
FY 71				
	-	-	-	-

Public Health

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
06/01/69	Darity	NIMH	$ 5,577	$ 581

FY 70

04/01/70	Darity	Westfield River Paper Co.	$ 400	$ -
02/01/70	Wisnieski	Mass. B.H.E.	7,200	1,892
		Subtotal	$ 7,600	$ 1,892

FY 71

07/01/70	Darity	Westfield River Paper Co.	$ 100	$ -
09/01/70	Darity	NIH	117,793	15,475
		Subtotal	$ 117,893	$ 15,475

Computer Sciences

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
09/01/68	Lee	NSF	$ 53,000	$ 13,333

FY 70

	-	--	-	-

FY 71

09/01/70	Arbib	Army	$ 15,077	$ 3,911
09/01/70	Arbib	NIH	19,798	4,312
05/01/71	Arbib	NIH	64,772	13,140
04/01/71	Foster	Control Data Corp.	20,000	5,640
		Subtotal	$ 119,647	$ 27,003

Marine Science

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
FY 69					
	-	-		-	-
FY 70					
	-	-		-	-
FY 71					
09/01/70	Yentsch	AEC		$ 41,000	$ 11,000
09/01/70	Yentsch	NSF		40,200	8,189
05/15/71	Yentsch	NSF		84,100	15,075
			Subtotal	$ 165,300	$ 34,264

Polymer Science and Engineering

FY 69

Beg. date	Principal Investigator	Agency		Total Cost	Ind. Cost
06/01/69	Karasz	NSF		$ 47,600	$ 10,500
09/15/68	Karasz	NSF		30,000	6,332
05/01/69	Porter	NIH		19,066	5,316
11/01/68	Porter	Furukawa Co.		239	-
			Subtotal	$ 96,905	$ 22,148

FY 70

09/01/69	Karasz	ACS		$ 7,667	$ 1,105
07/01/69	Porter	Ford		10,500	-
07/01/69	Porter	NSF		41,000	11,379
07/01/69	Porter	GE		5,000	-
01/01/70	Porter	Paint Res. Inst.		6,000	-
10/01/69	Price	NIH		25,510	6,970
			Subtotal	$ 95,677	$ 19,454

FY 71

08/01/70	Karasz	NSF		$ 17,400	$ 3,388
11/01/70	Karasz	AFOSR		25,000	6,050
09/01/70	Karasz	ACS		7,160	597
07/01/70	Porter	Goodrich Co.		10,100	-
09/01/70	Porter	NSF		68,400	16,328
04/01/71	Porter	Army		62,820	17,820
11/01/70	Price	NIH		24,738	7,210
06/01/71	Price	NSF		23,600	5,040
			Subtotal	$ 239,218	$ 56,433

Water Resources

FY 69

Beg. date	Principal Investigator	Agency	Total Cost	Ind. Cost
07/01/69	Berger	Off. Water Res. Res.	$ 100,000	$ -

FY 70

07/01/69	Berger	Off. Water Res. Res.	$ 100,000	$ -

FY 71

07/01/70	Berger	Off. Water Res. Res.	$ 100,000	$ -
10/01/70	Berger	Off. Water Res. Res.	30,000	$ -
		Subtotal	$ 130,000	

NATIONAL SCIENCE FOUNDATION

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
NATURAL SCIENCES AND MATHEMATICS			
Biochemistry	Nordin		$ 28,000
Botany	Smith		$ 40,400
Chemistry	Archer		$ 40,000
	Barnes		63,500
	Chien		24,000
	Hixson		23,000
	Holmes		16,800
	Lillya		33,000
	McEwen		46,100
	Miller		13,000
	Rausch		56,400
	Siggia		48,700
	Stein		25,100
		Subtotal	$ 389,600
Mathematics and Statistics	Becker		$ 10,800
	Broshi		8,700
	Hayes		7,000
	Mann		39,000
	Schweizer		14,300
		Subtotal	$ 79,800
Physics and Astronomy	Engelsberg		$ 36,800
	Ford		17,400
	Ford		35,900
	Gerace		50,000
	Gluckstern		26,900
	Goldenberg		16,300
	Goldenberg		20,000
	Huguenin		90,100
	Irvine		10,000
	Penchina		57,900
	Peterson		19,400
		Subtotal	$ 380,700
Zoology	Kaulenas		$ 20,000
SOCIAL AND BEHAVIORAL SCIENCES			
Economics	Muench		$ 15,762
	Sonnenschein		41,100
		Subtotal	$ 56,862
Psychology	Danielson		$ 27,700
	Moore		38,700
		Subtotal	$ 66,400
COLLEGE OF AGRICULTURE			
Food Science and Technology	Hultin		$ 44,000
	Hultin		20,000
		Subtotal	$ 64,000

NATIONAL SCIENCE FOUNDATION (Cont'd)

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
SCHOOL OF ENGINEERING			
Chemical Engineering	Vanpee		$ 43,200
Electrical Engineering	Yngvesson		$ 52,200
INTERDISCIPLINARY			
Marine Science	Yentsch		$ 40,200
	Yentsch		84,100
		Subtotal	$ 124,300
Polymer Science and Engineering	Karasz		$ 17,400
	Porter		68,400
			23,600
		Subtotal	$ 109,400
TOTAL FOR FY 71	43 Grants		$1,454,862
SPECIAL			
Psychology	Louttit		$ 582,000

FY 70

NATURAL SCIENCES AND MATHEMATICS			
Botany	Lockhart		$ 45,000
	Mulcahy		27,000
		Subtotal	$ 72,000
Chemistry	Archer		$ 21,000
	Cade		31,800
	MacKnight		29,100
	Rowell		35,000
	Stidham		14,500
		Subtotal	$ 131,400
Mathematics and Statistics	Becker		$ 9,600
	Chen		14,400
	Hayes		7,000
	Hertz		15,000
	Hurt		5,400
	Hurt		12,800
	Janowitz		14,000
	Mann		39,000
	Martindale		11,700
		Subtotal	$ 128,900
Physics and Astronomy	Arny		$ 20,800
	Brehm		111,000
	Dent		59,700
	Ford		18,200
	Goldenberg		28,900

NATIONAL SCIENCE FOUNDATION (Cont'd)

FY 70

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST
Physics and Astronomy (Cont'd)	Harrison	$ 35,900
	Huguenin	92,100
	Jones	39,900
	Peterson	13,700
	Sternheim	25,400
	Subtotal	$ 445,600
Zoology	Potswald	$ 28,000
SOCIAL AND BEHAVIORAL SCIENCES		
Psychology	Berger	$ 40,700
COLLEGE OF AGRICULTURE		
Agricultural Engineering	Rha	$ 15,000
Waltham Field Station	Galinat	$ 28,300
SCHOOL OF ENGINEERING		
Chemical Engineering	Lenz	$ 41,000
Mechanical and Aerospace Engr.	Boothroyd	$ 50,100
	Goss	15,000
	Kirchoff	14,900
	Mani	15,000
	Subtotal	$ 95,000
INTERDISCIPLINARY		
Polymer Science	Porter	$ 41,000
TOTAL FOR FY 70	36 Grants	$1,066,900

FY 69

NATURAL SCIENCES AND MATHEMATICS		
Botany	Ahmadjian	$ 31,700
	Bierhorst	14,300
	Bigelow	18,700
	Klekowski	26,200
	Schuster	15,700
	Schuster	24,800
	Wilce	19,000
	Subtotal	$ 150,400
Chemistry	Carpino	$ 38,100
	Holmes	38,500
	McEwen	35,100
	Rowell	12,300
	Siggia	46,800
	Stein	28,600
	Subtotal	$ 199,400

NATIONAL SCIENCE FOUNDATION (Cont'd)

FY 69

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
Mathematics and Statistics	Martindale		$ 11,700
	Schweizer		12,000
		Subtotal	$ 23,700
Microbiology	Dowell		$ 15,000
	Lessie		34,400
		Subtotal	$ 49,400
Physics and Astronomy	Ford		$ 17,200
	Huguenin		25,000
	Irvine		20,000
	Krotkov		48,600
	Sternheim		11,300
		Subtotal	$ 122,100
Zoology	Kato		$ 39,900
	Kaulenas		30,100
	Roberts, J. L.		30,500
		Subtotal	$ 100,500
SOCIAL AND BEHAVIORAL SCIENCES			
Economics	Smith		$ 30,900
Psychology	Moore		$ 15,700
COLLEGE OF AGRICULTURE			
Forestry and Wildlife Management	Wilson		$ 23,300
SCHOOL OF ENGINEERING			
Chemical Engineering	Douglas		$ 57,600
Electrical Engineering	Jackson		$ 15,000
	McIntosh		15,000
		Subtotal	$ 30,000
INTERDISCIPLINARY			
Computer Sciences	Lee		$ 53,000
Polymer Science and Engineering	Karasz		$ 47,600
	Karasz		30,000
		Subtotal	$ 77,600
TOTAL FOR FY 69	34 Grants		$ 933,600

NATIONAL INSTITUTES OF HEALTH

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
NATURAL SCIENCES AND MATHEMATICS			
Biochemistry	Gawienowski		$ 41,494
	Westhead		26,424
	Westhead		45,554
		Subtotal	$ 113,472
Chemistry	Brandts		$ 44,372
	Carpino		24,638
	Chien		18,736
	Stein		19,049
		Subtotal	$ 106,795
Microbiology	Canale		$ 16,231
	Cox		24,481
	Lessie		22,628
	Mortlock		18,932
		Subtotal	$ 82,272
Zoology	Anderson		$ 40,396
	Fairbairn		52,089
	Honigberg		50,935
	Rauch		46,855
	Roberts		24,962
	Snedecor		22,402
	Wyse		20,841
		Subtotal	$ 258,480
SOCIAL AND BEHAVIORAL SCIENCES			
Sociology	Yaukey		$ 16,094
COLLEGE OF AGRICULTURE			
Environmental Sciences	Walker		$ 15,089
Food Science and Technology	Levin		$ 17,830
	Nawar		21,000
		Subtotal	$ 38,830
Veterinary and Animal Science	Black		$ 13,850
	Howe		13,372
		Subtotal	$ 27,222
SCHOOL OF ENGINEERING			
Electrical Engineering	Thomas		$ 95,025
PUBLIC HEALTH	Darity		$ 117,793
INTERDISCIPLINARY			
Computer Science	Arbib		$ 19,798
	Arbib		64,772
		Subtotal	$ 84,570

NATIONAL INSTITUTES OF HEALTH (Cont'd)

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
Polymer Science and Engineering	Price		$ 24,738
TOTAL FOR FY 71	29 Grants		$ 980,380

FY 70

NATURAL SCIENCES AND MATHEMATICS			
Biochemistry	Westhead		$ 23,569
	Westhead		31,391
		Subtotal	$ 54,960
Chemistry	Brandts		$ 43,395
	Carpino		23,676
	McEwen		14,950
	Stein		19,499
		Subtotal	$ 101,520
Microbiology	Canale		$ 15,740
	Cox		23,230
	Lessie		19,371
	Mortlock		17,768
	Pfau		28,728
	Thorne		33,753
		Subtotal	$ 138,590
Zoology	Anderson		$ 47,671
	Fairbairn		49,262
	Honigberg		55,172
	Rauch		42,609
	Roberts, L. S.		25,811
	Snedecor		21,969
	Wyse		33,949
		Subtotal	$ 276,443
SOCIAL AND BEHAVIORAL SCIENCES			
Psychology	Levinger		$ 25,503
Sociology	Lee		$ 46,600
COLLEGE OF AGRICULTURE			
Environmental Sciences	Walker		$ 21,247
Food Science and Technology	Hultin		$ 20,275
	Levin		15,780
	Nawar		18,000
		Subtotal	$ 54,055
Plant and Soil Sciences	Barker		$ 23,868

NATIONAL INSTITUTES OF HEALTH (Cont'd)

FY 70

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
Veterinary and Animal Science	Black		$ 14,955
	Black		14,840
	Howe		12,934
		Subtotal	$ 42,729
SCHOOL OF ENGINEERING			
Electrical Engineering	Thomas		$ 18,556
INTERDISCIPLINARY			
Polymer Science and Engineering	Price		$ 25,510
TOTAL FOR FY 70	31 Grants		$ 829,581

FY 69

NATURAL SCIENCES AND MATHEMATICS			
Biochemistry	Westhead		$ 34,926
	Westhead		22,492
		Subtotal	$ 57,418
Chemistry	Brandts		$ 51,942
	Carpino		22,380
	McEwen		13,424
	Stein		19,920
	Stengle		11,517
		Subtotal	$ 119,183
Microbiology	Canale		$ 11,415
	Cox		22,304
	Holt		21,182
	Lessie		12,634
	Mortlock		18,240
	Pfau		30,223
	Thorne		28,074
		Subtotal	$ 144,072
Zoology	Anderson		$ 27,898
	Fairbairn		52,612
	Honigberg		53,015
	Rauch		40,098
	Roberts, L. S.		22,009
	Snedecor		29,207
		Subtotal	$ 224,839
SOCIAL AND BEHAVIORAL SCIENCES			
Psychology	Levinger		$ 16,519
	Weiss		26,769
		Subtotal	$ 43,288

NATIONAL INSTITUTES OF HEALTH (Cont'd)

FY 69

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST
COLLEGE OF AGRICULTURE		
Environmental Sciences	Walker	$ 14,300
Food Science and Technology	Hultin	$ 21,137
Veterinary and Animal Science	Howe	$ 9,581
SCHOOL OF ENGINEERING		
Electrical Engineering	Thomas	$ 22,725
SCHOOL OF PHYSICAL EDUCATION	Kroll	$ 24,473
INTERDISCIPLINARY	Porter	$ 19,066
TOTAL FOR FY 69	28 Grants	$ 700,082

NATIONAL INSTITUTE OF MENTAL HEALTH

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST
SOCIAL AND BEHAVIORAL SCIENCES		
Psychology	Donahoe	$ 20,694
	Epstein	46,932
	Steiner	18,874
	Subtotal	$ 86,500
COLLEGE OF AGRICULTURE		
Cranberry Station	Devlin	$ 14,960
Waltham Field Station	Feder	$ 40,516
SCHOOL OF ENGINEERING		
Chemical Engineering	Short	$ 43,165
Mechanical and Aerospace Engr.	McGowan	$ 43,733
TOTAL FOR FY 71	7 Grants	$ 228,874

FY 70

SOCIAL AND BEHAVIORAL SCIENCES		
Anthropology	Pi-Sunyer	$ 4,390
Psychology	Ayres	$ 5,976
	Clifton, C.	18,976
	Clifton, R.	5,926
	Daehler	6,706
	Donahoe	22,153
	Epstein	60,752
	Himmelfarb	7,090
	Krieckhaus	6,991
	Subtotal	$ 134,570
COLLEGE OF AGRICULTURE		
Veterinary and Animal Science	Smith	$ 9,529
SCHOOL OF ENGINEERING		
Chemical Engineering	Short	$ 23,095
TOTAL FOR FY 70	11 Grants	$ 171,584

FY 69

SOCIAL AND BEHAVIORAL SCIENCES		
Anthropology	Salzmann	$ 6,226

NATIONAL INSTITUTE OF MENTAL HEALTH (Cont'd)

FY 69

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST
Psychology	Clifton	$ 18,676
	Epstein	35,638
	Myers	20,452
	Trowill	16,398
	Subtotal	$ 91,164
COLLEGE OF AGRICULTURE		
Cranberry Station	Devlin	$ 17,200
Environmental Sciences	Gunner	$ 26,563
Food Science and Technology	Esselen	$ 25,000
	Francis	17,547
	Levin	16,761
	Nawar	11,360
	Stumbo	25,159
	Subtotal	$ 95,827
Veterinary and Animal Science	Snoeyenbos	$ 33,800
Waltham Field Station	Feder	$ 16,399
SCHOOL OF ENGINEERING		
Chemical Engineering	Short	$ 45,051
PUBLIC HEALTH	Darity	$ 5,577
TOTAL FOR FY 69	16 Grants	$ 337,807

OTHER D/HEW

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST
SOCIAL AND BEHAVIORAL SCIENCES		
Government	Howards	$ 71,506
Psychology	Anderson	$ 25,717
	Emrick	8,425
	Myers	53,702
	Subtotal	$ 87,844
Sociology	Sutton	$ 10,000
COLLEGE OF AGRICULTURE		
Plant and Soil Science	Barker	$ 30,789
SCHOOL OF ENGINEERING		
Chemical Engineering	Kittrell	$ 39,334
TOTAL FOR FY 71	7 Grants	$ 239,473

FY 70

SOCIAL AND BEHAVIORAL SCIENCES		
Psychology	Phillips	$ 6,100
	Watt	5,000
	Subtotal	$ 11,100
COLLEGE OF AGRICULTURE		
Veterinary and Animal Science	Snoeyenbos	$ 20,757
SCHOOL OF BUSINESS ADMINISTRATION	Singer	$ 5,200
TOTAL FOR FY 70	4 Grants	$ 37,057

DEPARTMENT OF DEFENSE

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
NATURAL SCIENCES AND MATHEMATICS			
Chemistry	Stengle		$ 10,000
Geology	Hayes		$ 57,869
	Hayes		9,385
	Hayes		9,485
		Subtotal	$ 76,739
Physics and Astronomy	Goldenberg		$ 1,000
	Sastry		1,800
	Strong		59,900
	Strong		40,700
		Subtotal	$ 103,400
COLLEGE OF AGRICULTURE			
Veterinary and Animal Science	Howe		$ 10,410
SCHOOL OF BUSINESS ADMINISTRATION	Balintfy		$ 59,000
SCHOOL OF ENGINEERING			
Chemical Engineering	Vanpee		$ 6,000
Electrical Engineering	Franks		$ 26,350
	McIntosh		15,645
	McIntosh		20,366
	Navon		26,300
		Subtotal	$ 88,661
Other Engineering	Picha		$ 160,000
INTERDISCIPLINARY			
Computer Sciences	Arbib		$ 15,077
Polymer Science and Engineering	Karasz		$ 25,000
	Porter		62,820
		Subtotal	$ 87,820
TOTAL FOR FY 71	19 Grants		$ 617,107

FY 70

NATURAL SCIENCES AND MATHEMATICS			
Chemistry	Stein		$ 25,000
Geology	Hayes		$ 9,281
	Hayes		89,123
	Hayes		32,562
		Subtotal	$ 130,966

DEPARTMENT OF DEFENSE (Cont'd)

FY 70

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST
Physics and Astronomy	Goldenberg	$ 10,000
	Strong	14,700
	Strong	40,700
	Subtotal	$ 65,400
SCHOOL OF ENGINEERING		
Civil Engineering	Bemben	$ 24,994
Electrical Engineering	McIntosh	$ 9,899
Mechanical and Aerospace Engr.	Poli	$ 72,930
Other Engineering	Picha	$ 180,000
TOTAL FOR FY 70	11 Grants	$ 509,189

FY 69

NATURAL SCIENCES AND MATHEMATICS		
Biochemistry	Gawienowski	$ 45,132
Geology	Hayes	$ 12,324
	Hayes	69,889
	Subtotal	$ 82,213
Physics and Astronomy	Mullin	$ 19,400
	Sastry	23,100
	Soltysik	30,400
	Strong	20,200
	Strong	41,800
	Subtotal	$ 134,900
COLLEGE OF AGRICULTURE		
Veterinary and Animal Science	Howe	$ 16,953
SCHOOL OF ENGINEERING		
Chemical Engineering	Roblee	$ 13,257
Electrical Engineering	McIntosh	$ 34,906
Other Engineering	Picha	$ 180,000
TOTAL FOR FY 69	12 Grants	$ 507,361

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
NATURAL SCIENCES AND MATHEMATICS			
Geology	Haggerty		$ 3,000
	McGill		14,136
		Subtotal	$ 17,136
Physics and Astronomy	Harkness		$ 60,000
	Harkness		50,000
	Irvine		37,700
	Strong		33,200
	Strong		16,800
	Strong		17,000
		Subtotal	$ 214,700
SCHOOL OF ENGINEERING			
Electrical Engineering	Monopoli		$ 19,449
TOTAL FOR FY 71		9 Grants	$ 251,285

FY 70

NATURAL SCIENCES AND MATHEMATICS			
Biochemistry	Nordin		$ 30,000
Geology	McGill		$ 6,508
	McGill		16,229
	Smith		5,000
		Subtotal	$ 27,737
Physics and Astronomy	Harkness		$ 60,000
	Huguenin		25,000
	Strong		66,500
	Strong		17,100
		Subtotal	$ 168,600
SCHOOL OF ENGINEERING			
Electrical Engineering	Monopoli		$ 13,429
Mechanical and Aerospace Engr.	Mani		$ 15,000
TOTAL FOR FY 70		10 Grants	$ 254,766

FY 69

NATURAL SCIENCES AND MATHEMATICS			
Physics and Astronomy	Harkness		$ 100,000
	Huguenin		24,500
	Strong		17,100
	Strong		7,400
	Strong		101,300
		Subtotal	$ 250,300

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (Cont'd)

FY 69

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST
SCHOOL OF ENGINEERING		
Electrical Engineering	Monopoli	$ 8,000
TOTAL FOR FY 69	6 Grants	$ 258,300

OTHER FEDERAL

AGENCY	INDEX NUMBERS
Agriculture, U.S. Department of	6, 9, 10, 11, 12, 44
Atomic Energy Commission	1, 2, 3, 17, 21, 22, 25, 36, 37
Commerce, U.S. Department of	32, 50
Environmental Protection Agency	8, 15
Environmental Sciences Services Administration	23, 24, 38
Federal Water Pollution Control Administration	26, 28, 33, 40, 45, 47, 49
Interior, U.S. Department of	16
Labor, U.S. Department of	39
National Air Pollution Control Administration	14
National Endowment for the Humanities	20
Public Roads, U.S. Bureau of	13, 31, 43
Saline Water, U.S. Office of	35
Sport Fisheries and Wildlife Service, U.S. Bureau of	30, 42
Treasury, U.S. Department of	5
Water Resources Research, U.S. Office of	4, 7, 18, 19, 27, 29, 34, 41, 46, 48, 51

OTHER FEDERAL

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	INDE NO.
NATURAL SCIENCES AND MATHEMATICS				
Physics and Astronomy	Hoffman		$ 39,500	1
	Shafer		160,000	2
		Subtotal	$ 199,500	
Zoology	Snyder		$ 18,494	3
SOCIAL AND BEHAVIORAL SCIENCES				
Government	Howards		$ 41,500	4
COLLEGE OF AGRICULTURE				
Agricultural Engineering	Clayton		$ 10,400	5
Agricultural and Food Economics	Christensen		$ 3,000	6
	Wyckoff		50,000	7
		Subtotal	$ 53,000	
Environmental Sciences	Litsky		$ 6,767	8
Forestry and Wildlife Management	Rhodes		$ 18,000	9
	Rhodes		9,900	10
	Rice		5,100	11
		Subtotal	$ 33,000	
Landscape Architecture	Zube		$ 3,000	12
Plant and Soil Science	Zak		$ 70,000	13
Waltham Field Station	Feder		$ 19,926	14
	Naegele		14,964	15
		Subtotal	$ 34,890	
SCHOOL OF ENGINEERING				
Chemical Engineering	Vanpee		$ 24,924	16
INTERDISCIPLINARY				
Marine Science	Yentsch		$ 41,000	17
Water Resources	Berger		$ 100,000	18
	Berger		30,000	19
		Subtotal	$ 130,000	
TOTAL FOR FY 71		19 Grants	$ 666,475	

FY 70

ARTS AND HUMANITIES				
History	Hanke		$ 12,420	20

OTHER FEDERAL (Cont'd)

FY 70

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	INDEX NO.
NATURAL SCIENCES AND MATHEMATICS				
Physics and Astronomy	Hoffman		$ 37,000	21
	Shafer		170,000	22
	Strong		30,000	23
	Strong		7,500	24
		Subtotal	$ 244,500	
Zoology	Snyder		$ 18,494	25
COLLEGE OF AGRICULTURE				
Environmental Sciences	Litsky		$ 27,436	26
Forestry and Wildlife Management	Carlozzi		$ 27,300	27
	Cole		6,840	28
	Larson		61,888	29
	McCann		4,760	30
		Subtotal	$ 100,788	
Plant and Soil Science	Zak		$ 50,000	31
SCHOOL OF BUSINESS ADMINISTRATION	Johnson, L. A.		$ 15,275	32
SCHOOL OF ENGINEERING				
Chemical Engineering	Lindsey		$ 32,164	33
INTERDISCIPLINARY				
Water Resources	Berger		$ 100,000	34
TOTAL FOR FY 70		15 Grants	$ 601,077	

FY 69

NATURAL SCIENCES AND MATHEMATICS				
Chemistry	Holmes		$ 41,520	35
Physics and Astronomy	Hoffman		$ 36,000	36
	Shafer		170,000	37
	Strong		34,700	38
		Subtotal	$ 240,700	
SOCIAL AND BEHAVIORAL SCIENCES				
Economics	Barkin		$ 10,800	39
COLLEGE OF AGRICULTURE				
Environmental Sciences	Litsky		$ 29,515	40
Forestry and Wildlife Management	Carlozzi		$ 63,250	41
	McCann		4,500	42
		Subtotal	$ 67,750	

OTHER FEDERAL (Cont'd)

FY 69

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST	INDEX NO.
Plant and Soil Sciences	Zak	$ 50,000	43
Veterinary and Animal Sciences	Fox	$ 8,500	44
SCHOOL OF ENGINEERING			
Chemical Engineering	Lindsey	$ 33,000	45
Civil Engineering	Adrian	$ 129,580	46
	Adrian	60,177	47
	Higgins	38,600	48
	Skrinde	30,160	49
	Subtotal	$ 258,517	
Other Engineering	Segool	$ 105,620	50
INTERDISCIPLINARY			
Water Resources	Berger	$ 100,000	51
TOTAL FOR FY 69	17 Grants	$ 945,922	

COMMONWEALTH

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST
COLLEGE OF AGRICULTURE			
Forestry and Wildlife Management	McCann		$ 20,000
TOTAL FOR FY 71		1 Grant	$ 20,000

FY 70

COLLEGE OF AGRICULTURE			
Forestry and Wildlife Management	McCann		$ 20,000
Waltham Field Station	Naegele		$ 17,568
SCHOOL OF ENGINEERING			
Civil Engineering	DiGiano		$ 108,550
	Feng		129,850
	Kuzminski		59,900
		Subtotal	$ 298,300
TOTAL FOR FY 70		5 Grants	$ 335,868

FY 69

SOCIAL AND BEHAVIORAL SCIENCES			
Sociology	Lee		$ 10,000
COLLEGE OF AGRICULTURE			
Forestry and Wildlife Management	McCann		$ 20,000
TOTAL FOR FY 69		2 Grants	$ 30,000

FOUNDATIONS

AGENCY	INDEX NUMBER
A. P. Sloan Foundation	23, 26
Albany Medical	18
American Cancer Society	2, 21
American Chemical Society - Petroleum Research Fund	3, 4, 5, 7, 8, 9, 10, 19, 22, 25, 30, 33, 34, 35
Arthritis Foundation	17
C. E. Merrill Trust	27
Carnegie Corporation	32
Esso Foundation	24
Frasch Foundation	1, 20
Lilly Foundation	12
Link Foundation	38
Marine Research Foundation, Inc.	15
Massachusetts Heart	29
Massachusetts Tuberculosis Association	16, 37
Medical Care and Educational Foundation	28, 36
National Association of Mental Health	14
Paint Research Institute	31
Pittsfield Anti T. B. Association	11
Research Corporation	6, 13

FOUNDATION

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	INDEX No.
NATURAL SCIENCES AND MATHEMATICS				
Biochemistry	Nordin		$ 8,000	1
	Parsons		8,356	2
		Subtotal	$ 16,356	
Chemistry	Barnes		$ 7,500	3
	Carpino		26,000	4
	Chien		20,000	5
	Hixson		5,000	6
	Hixson		7,500	7
	Miller		7,560	8
	Rausch		5,568	9
	Siggia		20,000	10
		Subtotal	$ 99,128	
Microbiology	Holt		$ 11,550	11
	Holt		4,000	12
		Subtotal	$ 15,550	
Physics and Astronomy	Huguenin		$ 73,000	13
SOCIAL AND BEHAVIORAL SCIENCES				
Psychology	Watt		$ 8,500	14
COLLEGE OF AGRICULTURE				
Cranberry Station	Deubert		$ 100	15
Environmental Sciences	Walker		$ 3,450	16
Veterinary and Animal Science	Nobel		$ 10,000	17
SCHOOL OF ENGINEERING				
Industrial Engineering	Rising		$ 14,700	18
INTERDISCIPLINARY				
Polymer Science and Engineering	Karasz		$ 7,160	19
TOTAL FOR FY 71		19 Grants	$ 247,944	

FY 70

NATURAL SCIENCES AND MATHEMATICS				
Biochemistry	Nordin		$ 6,000	20
	Parsons		50,140	21
		Subtotal	$ 56,140	
Chemistry	Archer		$ 7,500	22
	Lillya		16,100	23
	MacKnight		2,500	24
		Subtotal	$ 26,100	

FOUNDATION

FY 70

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR	TOTAL COST	INDEX NO.
Microbiology	Wilder	$ 9,257	25
Physics and Astronomy	Guyer	$ 6,500	26
SOCIAL AND BEHAVIORAL SCIENCES			
Government	Booth	$ 22,500	27
Sociology	Wilkinson	$ 16,457	28
SCHOOL OF PHYSICAL EDUCATION	Edington	$ 9,746	29
INTERDISCIPLINARY			
Polymer Science and Engineering	Karasz	$ 7,667	30
	Porter	6,000	31
	Subtotal	$ 13,667	
TOTAL FOR FY 70	12 Grants	$ 160,367	

FY 69

ARTS AND HUMANITIES			
English	Copeland	$ 10,000	32
NATURAL SCIENCES AND MATHEMATICS			
Chemistry	Brandts	$ 5,000	33
	McEwen	18,000	34
	Stein	24,000	35
	Subtotal	$ 47,000	
SOCIAL AND BEHAVIORAL SCIENCES			
Sociology	Wilkinson	$ 34,405	36
COLLEGE OF AGRICULTURE			
Environmental Sciences	Walker	$ 6,900	37
SCHOOL OF ENGINEERING			
Civil Engineering	Heronemus	$ 1,500	38
TOTAL FOR FY 69	7 Grants	$ 99,805	

INDUSTRY/INDUSTRIAL FOUNDATIONS

AGENCY	INDEX NUMBER
Agway, Inc.	2, 14, 21, 35, 43, 49, 50, 74
American Feed Manufacturers	55
American Metal, Inc.	19
Aquacultural Research Corporation	61
Beech Nut	9, 38
Berg Exterminating	8
Borden Chemical	51
Cape Cod Cranberry	4
Chemagro	6
Chevron, Inc.	60, 71
Consolidated Edison	13
Control Data Corporation	26
Eastern Artificial Insemination	23, 54
Food Mart, Inc.	3
Ford Motor Co.	24, 59
Furukawa Co.	75
Geigy Chemical Corporation	56, 68
General Electric	58
General Tire Rubber	31
Glass Container	10, 37, 66
Glycerine Producers Association	7
Goodrich Co.	27
Gulf Oil Corp.	1, 69
Heublin, Inc.	11, 39
Holly Farms Co.	52

INDUSTRY/INDUSTRIAL FOUNDATIONS (Cont'd)

AGENCY	INDEX NUMBER
Hunter Associates Laboratory, Inc.	41
Independent Nail	42
Kimberly Clark	65
J. E. Cain Co.	18, 47, 73
Merck	28, 29
Monsanto Co.	16, 30, 32, 34, 44
Ocean Spray Cranberry	5, 12, 40, 67
Oxford Pickle Co.	15
Pilch-DeKalb	22
R. T. Vanderbilt Co.	36, 63
Salisbury Industry	53
Shell, Inc.	48, 62, 64
T-H Chemical Co.	45, 70
Uniroyal	17, 33, 46, 72
Upjohn Co.	20
Westfield River Paper Co.	25, 57

INDUSTRY/INDUSTRIAL FOUNDATIONS

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	INDEX NO.
NATURAL SCIENCES AND MATHEMATICS				
Chemistry	Rausch		$ 5,000	1
COLLEGE OF AGRICULTURE				
Agricultural Engineering	Clayton		$ 1,116	2
Agricultural and Food Economics	Leed		$ 3,000	3
Cranberry Station	Cross		$ 200	4
	Cross		18,000	5
	Demoranville		300	6
		Subtotal	$ 18,500	
Environmental Sciences	Litsky		$ 3,700	7
Entomology	Lilly		$ 100	8
Food Science and Technology	Esselen		$ 6,000	9
	Esselen		14,000	10
	Esselen		24,000	11
	Francis		5,000	12
		Subtotal	$ 49,000	
Forestry and Wildlife Management	McCann		$ 1,500	13
Plant and Soil Science	Barker		$ 5,000	14
	Barker		1,000	15
	Bramlage		150	16
	Southwick		500	17
	Thomson		1,500	18
	Troll		800	19
		Subtotal	$ 8,950	
Veterinary and Animal Science	Fox		$ 3,000	20
	Fox		2,850	21
	Fox		7,500	22
	Gaunt		1,000	23
		Subtotal	$ 14,350	
Waltham Field Station	Naegele		$ 1,000	24
PUBLIC HEALTH	Darity		$ 100	25
INTERDISCIPLINARY				
Computer Sciences	Foster		$ 20,000	26
	Porter		10,100	27
		Subtotal	$ 30,100	
TOTAL FOR FY 71		27 Grants	$ 136,416	

INDUSTRY/INDUSTRIAL FOUNDATIONS (Cont'd)

FY 70

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	INDEX NO.
NATURAL SCIENCES AND MATHEMATICS				
Chemistry	Barnes		$ 5,000	28
	McEwen		1,000	29
	McEwen		1,000	30
	Stein		6,500	31
	Stein		3,000	32
		Subtotal	$ 16,500	
COLLEGE OF AGRICULTURE				
Cranberry Station	Cross		$ 500	33
	Demoranville		500	34
	Devlin		650	35
	Zuckerman		100	36
			$ 1,750	
Food Science and Technology	Esselen		$ 14,000	37
	Esselen		6,000	38
	Esselen		24,000	39
	Francis		10,000	40
	Francis		6,000	41
Forestry and Wildlife Management	Hoadley		$ 2,410	42
Plant and Soil Science	Barker		$ 5,000	43
	Bramlage		100	44
	Lord		500	45
	Southwick		1,000	46
	Thomson		1,500	47
	Vengris		500	48
		Subtotal	$ 8,600	
Veterinary and Animal Science	Fox		$ 2,000	49
	Fox		2,650	50
	Fox		4,596	51
	Fox		6,000	52
	Fox		5,500	53
	Gaunt		1,965	54
	Southwick		8,500	55
		Subtotal	$ 31,211	
Waltham Field Station	Naegele		$ 500	56
PUBLIC HEALTH	Darity		$ 400	57
INTERDISCIPLINARY				
Polymer Science and Engineering	Porter		$ 5,000	58
	Porter		10,500	59
		Subtotal	$ 15,500	
TOTAL FOR FY 70		32 Grants	$ 136,871	

INDUSTRY/INDUSTRIAL FOUNDATIONS (Cont'd)

FY 69

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	INDEX NO.
COLLEGE OF AGRICULTURE				
Cranberry Station	Cross		$ 500	60
	Deubert		2,000	61
	Tomlinson		500	62
	Zuckerman		100	63
		Subtotal	$ 3,100	
Entomology	Shaw		$ 3,000	64
Environmental Sciences	Litsky		$ 8,500	65
Food Science and Technology	Esselen		$ 14,000	66
	Francis		10,000	67
		Subtotal	$ 24,000	
Forestry and Wildlife Management	MacConnell		$ 1,000	68
Plant and Soil Sciences	Drake		$ 5,000	69
	Havis		500	70
	Lord		500	71
	Southwick		1,000	72
	Thomson		1,500	73
		Subtotal	$ 8,500	
Veterinary and Animal Science	Gaunt		$ 5,000	74
INTERDISCIPLINARY				
Polymer Science and Engineering	Porter		$ 239	75
TOTAL FOR FY 69		16 Grants	$ 53,339	

OTHER

AGENCY	INDEX NUMBERS
American Political Science Association	19
Column Research Council	22
Connecticut	6
Consumer Research Institute	15
Jet Propulsion Laboratory	3
Lower Pioneer Valley Regional Planning Commission	30
Massachusetts Board of Higher Education	23
Massachusetts Flower Growers	11
Massachusetts Fruit Growers Association	27
Massachusetts Golf Association	28
Massachusetts Nurse Association	26
Massachusetts Selectmen's Association	4, 18
Massachusetts Society for Promoting Agriculture	21
Massachusetts Water Resources Commission	8, 9
National Broiler Council	29
National Research Council - Canada	1, 16, 24
New England Board of Higher Education	25
New England Regional Commission	7
New England Research, Inc.	2
New England Vegetable Growers	12
Northeastern University	17
Population Council	10
Springfield Chamber of Commerce	13
Springfield Model Cities	14
State University of New York	20
Towns of Marion, Mattapoisett and Wareham, Ma.	5
United Engineers Trustees	31

OTHER

FY 71

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	TABLE NO.
NATURAL SCIENCES AND MATHEMATICS				
Biochemistry	Parsons		$ 487	1
Chemistry	Zajicek		$ 20,180	2
Geology	Wise		$ 22,168	3
SOCIAL AND BEHAVIORAL SCIENCES				
Government	Howards		$ 100	4
COLLEGE OF AGRICULTURE				
Agricultural Engineering	Clayton		$ 8,560	5
Agricultural and Food Economics	Crossmon		$ 56,800	6
Forestry and Wildlife Management	Gatslick		$ 10,000	7
	Larson		17,800	8
	McCann		8,000	9
		Subtotal	$ 35,800	
Veterinary and Animal Science	Duby		$ 9,600	10
Waltham Field Station	Naegele		$ 963	11
	Naegele		500	12
		Subtotal	$ 1,463	
SCHOOL OF BUSINESS ADMINISTRATION	McGarrah		$ 14,223	13
	McGarrah		1,818	14
	Venkatesan		1,427	15
		Subtotal	$ 17,468	
TOTAL FOR FY 71		15 Grants	$ 172,626	

FY 70

NATURAL SCIENCES AND MATHEMATICS				
Biochemistry	Reid		$ 5,000	16
SOCIAL AND BEHAVIORAL SCIENCES				
Government	Gere		$ 3,000	17
	Howards		5,100	18
	Howards		2,530	19
		Subtotal	$ 10,630	
COLLEGE OF AGRICULTURE				
Waltham Field Station	Naegele		$ 300	20
	Naegele		3,500	21
		Subtotal	$ 3,800	

OTHER (Cont'd)

FY 70

ADMINISTRATIVE UNIT	PRINCIPAL INVESTIGATOR		TOTAL COST	INDEX NO.
SCHOOL OF ENGINEERING				
Civil Engineering	Chajes		$ 1,000	22
PUBLIC HEALTH	Wisnieski		$ 7,200	23
TOTAL FOR FY 70		8 Grants	$ 27,630	

FY 69

NATURAL SCIENCES AND MATHEMATICS				
Biochemistry	Parsons		$ 462	24
SOCIAL AND BEHAVIORAL SCIENCES				
Sociology	Lee		$ 20,000	25
COLLEGE OF AGRICULTURE				
Plant and Soil Science	Havis		$ 1,000	26
	Southwick		500	27
	Troll		500	28
		Subtotal	$ 2,000	
Veterinary and Animal Science	Fox		$ 5,500	29
SCHOOL OF BUSINESS ADMINISTRATION	McGarrah		$ 20,245	30
SCHOOL OF ENGINEERING				
Civil Engineering	Chajes		$ 1,000	31
TOTAL FOR FY 69		8 Grants	$ 49,207	

TRAINING AND FELLOWSHIPS

FY 71

ADMIN. UNIT	DEPARTMENT	PRIN. INVEST.	T/F	DATE	AGENCY	TOTAL AMT.
Nat. Sci. Math						$ 60,830
	Chemistry	Posner	F	07/01/70	American Cancer Society	2,678
	Zoology	Bartlett	T	06/01/71	NSF	13,230
		Bartlett	T	08/16/70	NSF	17,080
		Fairbairn	T	07/01/70	NIH	27,842
						58,152
Soc. Beh. Sci.						$ 198,267
	Psych.	Appley	T	07/01/70	NIMH	42,071
		Phillips	T	07/01/70	NIMH	99,365
		Trowill	T	07/01/70	NIMH	42,071
						183,507
	Speech	Nober	T	09/01/70	HEW	14,760
Agriculture						$ 107,019
	Ag. & Fd.	Foster	T	11/01/70	Peace Corps	11,710
	Forestry	Sheldon	T	07/01/70	Wildlife Mgt. Inst.	500
	Vet. & Ani.	Black	T	07/01/70	NIH	46,913
	Other	Perkins	T	01/01/71	Army	47,896
Engineering						$ 113,327
	Civil	Feng	T	07/01/70	NIH	27,113
		Feng	T	07/01/70	Fed. Water Poll. Control Agen.	34,882
		Doyle	T	09/01/70	Inst. of Traffic Engrs.	3,000
		Nash	T	11/11/70	NSF	20,225
						85,220
	Electrical	Thomas	T	05/01/71	NIH	28,107

TRAINING AND FELLOWSHIPS (Cont'd)

FY 71

ADMIN. UNIT	DEPARTMENT	PRIN. INVEST	T/F	DATE	AGENCY	TOTAL AMT.
Graduate School						$ 35,700
	Polymer Sci.	Porter	T	10/01/70	NSF	35,700
Nursing						$ 72,723
	Nursing	Petrunenko	T	02/01/71	PHS	25,349
		Earles	T	09/01/70	NIH	20,768
		Maher	T	07/01/70	NIMH	26,606
						72,723
Public Health						$ 72,480
	Public Health	Darity	T	04/01/71	NIH	35,260
		Peters	T	09/01/70	Health Manpower Train. Ser.	26,600
		Reed	T	03/22/71	NIH	10,620
						72,480
					FY 1971 TOTAL 24 Grants	$ 660,346

FY 70

Nat. Sci. Math						$ 131,439
	Chemistry	Lillya	F	09/01/69	American Chem. Soc.	18,000
		Lillya	F	04/01/70	A. P. Sloan Foundation	16,100
		Posner	F	07/01/69	American Cancer Soc.	14,084
						48,184
	Micro.	Pfau	F	09/01/69	PHS	21,514
	Physics	Patten	T	07/01/69	NSF	7,620
	Zoology	Bartlett	T	08/25/69	NSF	13,230
		Fairbairn	T	07/01/69	NIH	40,891
						54,121

TRAINING AND FELLOWSHIPS (Cont'd)

FY 70

ADMIN. UNIT	DEPARTMENT	PRIN. INVEST.	T/F	DATE	AGENCY	TOTAL AMT.
Soc. Beh. Sci.						$ 169,149
	Psych.	Appley	T	07/01/69	NIMH	42,761
		Purcell	T	07/01/69	NIMH	101,128
						143,889
	Speech	Hipskind	T	09/01/69	Rehab. Ser. Admin.	9,360
		Reid	T	06/01/70	Office of Education	15,900
						25,260
Agriculture						$ 192,449
	Forestry	Sheldon	T	09/01/69	Wildlife Mgt. Inst.	1,259
	Pl. & Soil	Goddard	T	07/01/69	NSF	27,223
	Vt. & Ani.	Black	T	07/01/69	NIH	48,536
	Other	Spielman	T	01/16/70	Peace Corps	7,353
		Perkins	T	07/01/69	Army	53,795
		Perkins	T	04/01/70	Army	54,283
						115,431
Engineering						$ 167,871
	Civil	Feng	T	07/01/69	HEW	19,335
		Feng	T	07/01/69	PHS	18,801
		Feng	T	09/01/69	PHS	52,719
		Feng	T	07/01/69	Fed. Water Poll. Control Admin.	42,256
						133,111
	Mech. & Aero.	Zinsmeister	T	07/01/69	NSF	7,920
	Ocean	Nash	T	04/01/70	NSF	16,840
	Other	Picha	T	07/01/69	General Electric Co.	10,000

TRAINING AND FELLOWSHIPS (Cont'd)

FY 70

ADMIN. UNIT	DEPARTMENT	PRIN. INVEST.	T/F	DATE	AGENCY	TOTAL AMT.
Nursing						$ 54,525
	Nursing	Maher	T	07/01/69	NIMH	26,957
		Petrunenko	T	02/01/70	PHS	27,568
						54,525
Labor						$ 239,868
	Labor	Friedman	T	10/01/69	HEW-Admin. on Aging	40,866
		Seligman	T	11/01/69	Off. of Economic Opp.	199,002
						239,868
Public Health						$ 62,609
	Public Health	Darity	T	04/15/70	Health Man. Educ. Ser.	39,236
		Gage	T	09/01/69	HEW	23,373
						62,609
					FY 1970 TOTAL 30 Grants	$1,017,910

FY 69

Nat. Sci. Math						$ 18,564
	Micro.	Pfau	F	09/01/68	PHS	18,564
Soc. Beh. Sci.						$ 24,939
	Speech	Gough	T	06/01/69	Office of Education	15,900
		Gough	T	09/01/68	Voc. Rehab. Admin.-HEW	9,039
						24,939
Agriculture						$ 1,000
	Land. Arch.	Zube	T	01/01/69	Anna B. Stearns Fund	1,000
Nursing						$ 71,652
	Nursing	Earles	T	01/01/69	PHS	37,042

TRAINING AND FELLOWSHIPS (Cont'd)

FY 69

ADMIN. UNIT.	DEPARTMENT	PRIN. INVEST.	T/F	DATE	AGENCY		TOTAL AMT.
	Nursing (cont'd)	Earles	T	01/01/69	PHS		6,098
		Petrunenko	T	02/01/69	PHS		28,512
							71,652
Public Health							$ 38,670
	Public Health	Gage	T	04/15/69	HEW		38,670
					FY 1969 TOTAL	8 Grants	$ 154,825

ADMIN. UNIT	DEPARTMENT	PRIN. INVEST.	DATE	AGENCY	TOTAL AMT.
			FY 71		
Nat. Sci. Math					$ 509,500
	Chemistry	Barnes	07/01/70	NSF	25,000
		Haney	10/01/70	Merck & Co.	1,000
		McEwen	09/01/70	NSF	483,500
					509,500
Engineering					$ 80,300
	Electrical	Glorioso	07/01/70	NSF	25,000
		McIntosh	06/01/71	NSF	38,800
					63,800
	Mech. & Aero.	Russell	07/01/70	NSF	16,500
Graduate School					$ 61,500
	Poly. Sci.	Porter	05/16/71	NSF	41,000
		Porter	04/01/71	NSF	20,500
					61,500
				TOTAL FOR FY 1971 8 Grants	$ 651,300
			FY 70		
Engineering					$ 20,600
	Electrical	Monopoli	07/01/69	NSF	20,600
				TOTAL FOR FY 1970 1 Grant	$ 20,600
			FY 69		
Nat. Sci. Math					$ 19,610
	Chemistry	Brandts	09/15/68	A. P. Sloan Foundation	6,500
		Lillya	06/01/69	A. P. Sloan Foundation	1,110
		McEwen	05/16/69	NSF	12,000
					19,610
Engineering					$ 44,000
	Civil	Nash	04/01/69	NSF	27,000
	Electrical	McIntosh	07/01/68	NSF	17,000
Graduate School					$ 15,300
	Poly. Sci.	Porter	06/01/69	NSF	15,300

FACULTY RESEARCH GRANTS

FY 71

COLLEGE OF AGRICULTURE:

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
Agri. & Food Econ.	Christensen, Robert L.		$ 166.00		$ 166.00
	Jarvesoo, Elmar		250.00		250.00
	Wyckoff, J. B.		450.00		450.00
		3	$ 866.00	3	$ 866.00
Animal Science	Nobel, Werner	1	$ 1,000.00	0	$ -0-
Entomology	Stoffolano, John G., Jr.	1	$ 718.00		def. til Oct.
Environmental Science	Gunner, Haim B.		$ 300.00		$ 300.00
	Litsky, Warren		275.00		275.00
		2	$ 575.00	2	$ 575.00
Food and Agri. Engr.	Whitney, Lester F.		$ 435.00		$ 413.00
	Zahradnik, J. W.		1,200.00		1,000.00
		2	$ 1,635.00	2	$ 1,413.00
Forestry & Wildlife Mgt.	Johnson, James E.	1	$ 760.00	1	$ 760.00
	TOTAL FOR COLLEGE	10	$ 5,554.00	8	$ 3,614.00

FACULTY OF ARTS AND HUMANITIES:

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
Art	Davies, Hanlyn		$ 1,000.00		$ 1,000.00
	Hendricks, James		1,335.00		1,000.00
	Mallary, Robert		1,000.00		700.00
	Norton, Paul F.		600.00		600.00
	Parker, Elizabeth		331.00		192.00
	Roy, John		1,000.00		1,000.00
	Schleappi, Dale		1,034.00		600.00
	Wozniak, James L.		1,000.00		1,000.00
		8	$ 7,300.00	8	$ 6,092.00
Comparative Literature	Miller, Lucien	1	$ 1,266.00	1	$ 630.00
English	Brogan, Howard O.		$ 300.00		$ 300.00
	Duckert, Audrey R.		2,000.00		1,000.00
	Gallo, Ernest A.		500.00		500.00
	Lowance, Mason I., Jr.		500.00		490.00
	Weston, John C.		450.00		427.00
	Wolff, Michael		500.00		500.00
	Wolff, Michael		250.00		250.00
		7	$ 4,500.00	7	$ 3,467.00
French	Mankin, Paul A.		$ 175.00		$ 50.00
	O'Connell, David		400.00		384.00
	Raymond, Agnes G.		700.00		350.00
		3	$ 1,275.00	3	$ 784.00
Hispanic Lang. & Lit.	Barreda-Tomas, Pedro		$ 1,410.00		$ 950.00
	Fernandez-Turienzo		365.00		270.00
	Greenfield, Sumner M.		300.00		140.00
	Sturm, Harlan G.		315.00		302.00
	Wexler, Sidney F.		650.00		300.00
		5	$ 3,040.00	5	$ 1,962.00
Germanic Lang. & Lit.	Ryan, Lawrence		$ 263.00		$ 263.00
	vonKries, F. W.		143.00		143.00
		2	$ 406.00	2	$ 406.00

FACULTY OF ARTS AND HUMANITIES (Cont'd):

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
History	Boyer, Paul S.		$ 500.00		$ 490.00
	Illardi, Vincent		1,350.00		900.00
	Lewis, Archibald R.		355.00		337.00
	McNeal, Robert H.		500.00		490.00
	Minear, Richard H.		1,000.00		1,000.00
	Oates, Stephen B.		1,025.00		1,000.00
		6	$ 4,730.00	6	$ 4,217.00
Linguistics	Akmajian, Adrian		$ 870.00		$ 800.00
	Demers, Richard A.		1,290.00		1,000.00
	Heny, Frank W.		950.00		800.00
		3	$ 3,110.00	3	$ 2,600.00
Music	King, John R.		$ 1,000.00		$ 1,000.00
	Olevsky, Julian		1,000.00		500.00
	Steele, Ronald		350.00		350.00
		3	$ 2,350.00	3	$ 1,850.00
	TOTAL FOR FACULTY	38	$27,977.00	38	$22,008.00

FACULTY OF NATURAL SCIENCES:

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
Botany	Walker, James W.	1	$ 626.00	1	$ 626.00
Chemistry	Cade, Paul E.		$ 200.00		$ 200.00
	Curran, David J.		886.00		886.00
	Hixson, Stephen S.		1,000.00		1,000.00
	Hixson, Stephen S.		900.00		900.00
	Holmes, Robert R.		427.00		427.00
	Uden, Peter C.		1,000.00		1,000.00
		6	$ 4,413.00	6	$ 4,413.00
Geology and Geography	Farquhar, Oswald		$ 300.00		$ 300.00
	Farquhar, Oswald		1,000.00		1,000.00
	Meyer, David R.		600.00		576.00
	Smith, H. T. U.		900.00		900.00
	Smith, H. T. U.		1,000.00		1,000.00
	Wilkie, Richard W.		125.00		125.00
		6	$ 3,925.00	6	$ 3,901.00
Mathematics	Hurt, Norman E.	1	$ 1,150.00	1	$ 382.00
Microbiology	Wilder, Martin S.	1	$ 380.00	1	$ 380.00
Physics and Astronomy	Byron, Frederick W., Jr.		$ 710.00		$ 305.00
	Cook, Leroy F.		360.00		360.00
	Dent, William A.		654.00		280.00
	Golowich, Eugene		250.00		-0-
	Inglis, David R.		245.00		245.00
	Jones, P. R.		360.00		180.00
	Peterson, Gerald A.		300.00		300.00
	Pichanick, F. M. J.		100.00		100.00
		8	$ 2,979.00	7	$ 1,770.00
Zoology	Honigberg, B. M.		$ 1,000.00		$ 1,000.00
	Honigberg, B. M.		596.00		285.00
	Roberts, L. S.		700.00		700.00
		3	$ 2,296.00	3	$ 1,985.00
	TOTAL FOR FACULTY	26	$15,769.00	25	$13,457.00

FACULTY OF SOCIAL AND BEHAVIORAL SCIENCES:

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
Anthropology	Armelagos, George J.		$ 430.00		$ 330.00
	Ingersoll, Daniel W.		550.00		550.00
		2	$ 980.00	2	$ 880.00
Economics	Burghardt, Galen D., Jr.		$ 950.00		$ 700.00
	Kane, James A.		960.00		-0-
	Love, Thomas A.		375.00		375.00
		3	$ 2,285.00	2	$ 1,075.00
Government	Feit. Edward		$ 1,000.00		$ 550.00
	Vali, Ferenc A.		800.00		800.00
	Wiarda, Howard J.		760.00		700.00
		3	$ 2,560.00	3	$ 2,050.00
Psychology	Carlson, Neil R.		$ 500.00		$ 500.00
	Carlson, Neil R.		500.00		490.00
	Chumbley, James I.		657.00		657.00
	Clifton, Charles		599.00		599.00
	Feldman. Robert S.		1,000.00		960.00
	Feldman, Robert S.		265.00		265.00
	Fite, Katherine		597.00		600.00
	Fite Katherine		969.00		921.00
	Kamil, Alan C.		826.00		826.00
	Kamil, Alan C.		990.00		940.00
	Kerpelman, Larry C.		588.00		287.00
	Kerpelman. Larry C.		500.00		500.00
	Krieckhaus, E. E.		375.00		375.00
	Levinger, George		57.00		57.00
	Louttit, Richard T.		600.00		600.00
	Pollatsek. Alexander		325.00		325.00
	Well. Arnold D.		935.00		935.00
		17	$10,283.00	17	$ 9,837.00

FACULTY OF SOCIAL AND BEHAVIORAL SCIENCES (Cont'd):

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
Sociology	Chevan, Albert		$ 100.00		$ 100.00
	Chilton, Roland J.		335.00		335.00
	Driver Edwin D.		1,000.00		900.00
	Driver Edwin D.		1,091.00		827.00
	Hollander, Paul		700.00		600.00
	Mehta, Surinder K.		100.00		-0-
	Mehta, Surinder K.		1,000.00		1,000.00
	Page, Charles H.		350.00		350.00
	Park, Peter		750.00		750.00
	Park, Peter		2,470.00		1,000.00
	Platt, Gerald M.		760.00		500.00
	Roof, W. Clark		387.00		300.00
	Simpson, Jon E.		269.00		258.00
	Sutton, Gordon F.		450.00		450.00
	Wilson, William J.		365.00		365.00
	Wilson, William J.		222.00		222.00
		16	$10,349.00	15	$ 7,957.00
Speech	Conville, Richard L., Jr.		$ 500.00		$ 500.00
	Meyer, Timothy P.		850.00		830.00
		2	$ 1,350.00	2	$ 1,330.00
	TOTAL FOR FACULTY	43	$27,807.00	41	$23,129.00

SCHOOL OF BUSINESS ADMINISTRATION.

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
General Business and Finance	Balintfy, Joseph L.		$ 860.00		$ 315.00
	Balintfy, Joseph L.		285.00		285.00
	Osborn, Grant		1,092.00		600.00
		3	$ 2,237.00	3	$ 1,200.00
Marketing	Monroe, Kent B.		$ 1,750.00		$ 950.00
	Monroe, Kent B.		700.00		350.00
	Paul, Gordon W.		1,000.00		500.00
	Schwartz, George		1,000.00		1,000.00
	Venkatesan, M.		650.00		-0-
	Wiek, James L.		1,493.00		1,000.00
		6	$ 6,593.00	6	$ 3,800.00
	TOTAL FOR SCHOOL	9	$ 8,830.00	9	$ 5,000.00

SCHOOL OF ENGINEERING.

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
Chemical	Eldridge, J. W.		$ 750.00		$ 650.00
	Lenz, Robert W.		555.00		330.00
		2	$ 1,305.00	2	$ 980.00
Civil	Adrian, Donald		$ 500.00		$ 500.00
	Colonell, Joseph M.		300.00		300.00
	DiGiano, Francis A.		1,000.00		-0-
	Kuzminski, Lawrence N.		345.00		345.00
		4	$ 2,145.00	3	$ 1,145.00
Electrical	Scott, Donald E.		$ 250.00		$ 237.00
	Tang, Ting-wei		450.00		427.00
		2	$ 700.00	2	$ 664.00
Industrial	Miser, Hugh J.		$ 375.00		$ 375.00
	Rising, Edward J.		150.00		150.00
		2	$ 525.00	2	$ 525.00
Mechanical and Aerospace	Crossley, F. R. E.		$ 325.00		$ 261.00
	Poli, C. R.		800.00		325.00
	Ritter, John E.		500.00		-0-
		3	$ 1,625.00	3	$ 586.00
	TOTAL FOR SCHOOL	13	$ 6,300.00	12	$ 3,900.00

GRADUATE SCHOOL:

Department	Principal Investigator	No.	$ Amt.	No.	$ Amt.
Computer Science	Arbib, Michael A.		$ 370.00		$ 370.00
	Arbib, Michael A.		800.00		-0-
		2	$ 1,170.00	1	$ 370.00
Marine Science	Gilfillan, Edward S.		$ 912.00		$ 885.00
	Sears, James R.		955.00		955.00
	Yentsch, Charles S.		400.00		400.00
		3	$ 2,267.00	3	$ 2,240.00
Polymer Science and Engr.	Karasz, Frank E.		$ 461.00		$ 461.00
	Karasz, Frank E.		292.00		292.00
	Vogl, Otto		1,200.00		1,200.00
		3	$ 1,953.00	3	$ 1,953.00
Univ. Computing Center	Gonter, Robert H.	1	$ 160.00	1	$ 160.00
	TOTAL FOR SCHOOL	9	$ 5,550.00	8	$ 4,723.00

SCHOOL OF EDUCATION.

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
School of Education	Hambleton, R. K.	1	$ 500.00	1	$ 500.00
	TOTAL FOR SCHOOL	1	$ 500.00	1	$ 500.00

SCHOOL OF HOME ECONOMICS:

Human Development	Collard, Roberta R.		$ 1,000.00		$ 960.00
	Craig, Grace J.		950.00		-0-
		2	$ 1,950.00	2	$ 960.00
	TOTAL FOR SCHOOL	2	$ 1,950.00	2	$ 960.00

SCHOOL OF PHYSICAL EDUCATION

Physical Education	Edington, Dee W.		$ 89.00		$ 89.00
	Lewis, Guy		1,480.00		-0-
	Loy, John W.		1,000.00		1,000.00
	Plagenhoef, Stanley		280.00		280.00
		4	$ 2,849.00	4	$ 1,369.00
	TOTAL FOR SCHOOL	4	$ 2,849.00	4	$ 1,369.00

PUBLIC HEALTH

Public Health	Darity, William A.		$ 200.00		$ 200.00
	Stryker, J. W.		750.00		750.00
	Tuthill, Robert W.		300.00		300.00
		3	$ 1,250.00	3	$ 1,250.00
	TOTAL FOR DEPARTMENT	3	$ 1,250.00	3	$ 1,250.00

OTHER ADMINISTRATIVE UNITS:

Department	Principal Investigator	Requested No.	Requested $ Amt.	Awarded No.	Awarded $ Amt.
Counseling Center	Haase, Richard	1	$ 405.00	1	$ 405.00
Library	Collins, Pauling P.	1	$ 1,500.00	1	$ 1,500.00
University Health Service	Hall, Leo B. Zapka, Jane M.		$ 1,500.00 1,700.00		$ 1,000.00 def. til Oct.
		2	$ 3,200.00	1	$ 1,000.00

UNIVERSITY OF MASSACHUSETTS/BOSTON:

Biology	Safwat, F. M.	1	$ 500.00	1	$ 500.00
History	Foss, Clive	1	$ 400.00	1	$ 400.00
	TOTAL FOR BOSTON	2	$ 900.00	2	$ 900.00

Appropriation for the fiscal year 1968-69, 1969-70, 1970-71.

(State funds not including -01)

1968-89:	$49,050.00
1969-70:	$43,550.00
1970-71:	$63,700.00

Personnel - number in each rank.

September, 1968:

John A. N. Lee, Professor and Head of Computer Science Program
Caxton C. Foster, Professor of Computer Science
Sue N. Stidham, Assistant Professor of Computer Science
James Bouhana, Temporary Instructor

Joint Appointments

Conrad A. Wogrin, Professor of Computer Science, Director of Research Computing Center
Frederick D. Stockton, Associate Professor of Computer Science and Civil Engineering
Robert R. Archer, Professor of Computer Science and Engineering (on leave 1968-69)
John Ulrich, Assistant Professor of Computer Science and Education
Jack Peterson, Lecturer, Computer Science and Research Computing Center

Professors: 2 Assistant Professors: 1 Instructor: 1

Joint Appointments: 5

2. (Continued)

September 1969:

Conrad A. Wogrin, Professor and Acting Head of Computer Science Program, Director of Research Computing Center
John A. N. Lee, Professor of Computer Science, Associate Director of Research Computing Center
Caxton C. Foster, Associate Professor of Computer Science, Associate Director of Research Computing Center
Sue N. Stidham, Assistant Professor of Computer Science
Edward M. Riseman, Assistant Professor of Computer Science
Gerard P. Weeg, Visiting Professor of Computer Science

Joint Appointments

Robert R. Archer, Professor of Computer Science and Civil Engineering
Frederick D. Stockton, Associate Professor of Computer Science and Civil Engineering

Associated Faculty

G. Ernest Anderson, Associate Professor of Education
John W. Ulrich, Assistant Professor of Education
Roger W. Ehrich, Assistant Professor of Electrical Engineering
Robert M. Glorioso, Assistant Professor of Electrical Engineering
Imsong Lee, Professor of Electrical Engineering
Frank Edwards, Associate Professor of Electrical Engineering

Professors: 2 Associate Professors: 1 Assistant Professors: 2

Visiting Professors: 1 Joint Appointments: 2 Associated Faculty: 6

(Continued)

September 1970:

Michael A. Arbib, Professor and Chairman of Computer Science Program
John A. N. Lee, Professor of Computer Science (on leave 1970-71)
Conrad A. Wogrin, Professor of Computer Science, Director of Research Computing Center
Caxton C. Foster, Professor of Computer Science, Associate Director of Research Computing Center
Edward M. Riseman, Assistant Professor of Computer Science
Sue N. Stidham, Assistant Professor of Computer Science
Webb T. Comfort, Visiting Professor of Computer Science

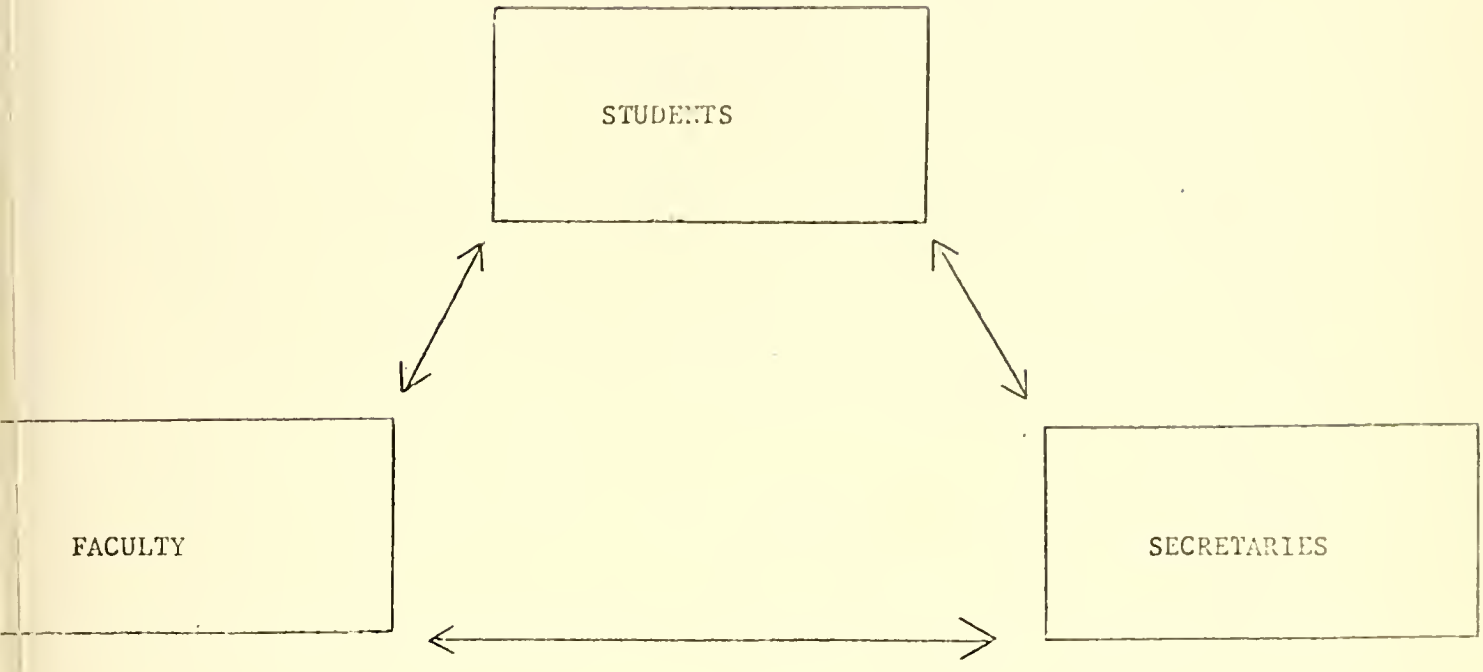
Associated Faculty

G. Ernest Anderson, Associate Professor of Education
Robert R. Archer, Professor of Civil Engineering
Leonard Bobrow, Assistant Professor of Electrical Engineering
Roger W. Ehrich, Assistant Professor of Electrical Engineering
Robert M. Glorioso, Assistant Professor of Electrical Engineering
Imsong Lee, Professor of Electrical Engineering
Charles Randall, Associate Professor of Mathematics
Frederick D. Stockton, Associate Professor of Civil Engineering

Professors: 4 Assistant Professors: 2 Visiting Professors: 1

Associated Faculty: 8

3. Organization Chart of Computer Science Program.



4. Students served: (Fall and Spring)

	1968-69	1969-70	1970-71
a) FTE Majors	21	25	31
b) Number of students taught	894	1051	895

5. Faculty publications, research grants, research projects and other professional activities.

Professor Michael A. Arbib, Professor and Chairman of Computer Science

Technical Reports:

70C-1 (with P. Dev and R. L. Didday): "Action-Oriented Memory Subserving Perception"
70C-2 "Organizational Principles for Embryological and Neurophysiological Processes"
70C-3 "On the Likely Evolution of Communicating Intelligence on Other Planets"
70C-5 "Transformations and Somatotopy in Perceiving Systems"

Papers:

"Cognition - A Cybernetic Approach" in "Cognition: A Multiple View," (Paul L. Garvin, Ed.) Spartan Books (1970) 331-343.

"On the Convergence of Grossberg's Learning Equations," J. Math. Anal. Appl. 31 (1970) 545-553.

Papers were presented at conferences in Los Angeles, Gainesville and New York; talks were given at M.I.T., The University of Western Ontario, Hampshire College, Yale, the University of Connecticut, and at least five other departments at the University of Massachusetts. Papers were refereed for at least a dozen journals, etc.

Research grants:

Department of the Army: DAHC 04-70-C-0043

National Institutes of Health: NS 09755-01

Supervision of three Ph.D. candidates - two from Stanford University and one from the Mathematics Institute in Bucharest.

5. Continued

Professor Conrad A. Wogrin, Professor of Computer Science, Director of the University Computing Center.

Professional Activities:

Conferences attended -

October 15, 1970 - panel member on Channel 8 - "Is Privacy Dead?" (panel on data banks and invasion of privacy).

October 17, 1970 - ASEE Conference (American Society for Engineering Education) - panel member (Durham, New Hampshire).

October 26, 1970 - FOCUS IV (Fourth Semi-Annual FOCUS Conference) in Washington, D. C.

November 4, 1970 - NEREM '70 - IEE- Northeast Electronics Research and Engineering Meeting in Boston.

December 15, 1970 - FORTRAN Workshop at University of New Hampshire - luncheon speaker on UMASS system in Computer Science.

April 20-21, 1971 - helped organize and attended APL Conference in Berkeley, California.

Lectures -

October 5, 1970 - series of APL lectures given to Electrical Engineering seminars.

February 10, 1971 - APL lectures given to Electrical Engineering classes.

February 27, 1971 - lecture at University of Denver.

October 15, 1970 - member of Ph.D. oral examination committee for Jim Burrows.

5. Continued

Professor Caxton C. Foster, Professor of Computer Science and Associate Director of the University Computing Center.

Publications:

Computer Architecture, Von Nostrand Reinhold.

Papers:

(with R. Gonter) "Conditional Interpretation of Operation Codes," IEEE TC, C-20, 1, January 1971, p.108-111.

"Uncoupling Central Processor and Storage Device Speeds," The Computer Journal (British), 14, 1, January 1971, p. 45-48.

"An Unclever Timesharing System," Computing Surveys, 3,1, March 1971, p. 23-48.

(with R. Gonter and E. Riseman) "Measures of Op-Code Utilization," IEEE TC, C-20,5, May 1971, p. 582-584.

Research Grants:

$20,000 from Control Data to study op-code utilization - Summer 1971. M10AA.

Other Professional Activities:

Luncheon speaker at Conference on Government Data Processing, Albany, N.Y. June 8, 1971. Topic: Computers and Privacy.

Appeared before Constitutional Rights Subcommittee of U.S. Senate in Washington, D. C. to testify on dangers of data banks.

Appeared on "The Advocates" (nationwide NET program) to testify on the dangers of data banks.

Designed and flew the M-20 - the first known radio-controlled model non-rigid airship.

5. Continued

Professor Edward M. Riseman, Assistant Professor of Computer Science

Publications:

"Logical Networks for Feature Extraction," IEEE Transactions on Systems Science and Cybernetics, January 1971, pp. 43-55.

(with R. Ehrich), "Contextual Word Recognition Using Binary Digrams," IEEE Transactions on Computers, April 1971, pp. 397-403.

(with C. Foster and R. Gonter), "Measures of Op-Code Utilization," IEEE Transactions on Computers, May 1971, pp. 582-584.

(with R. Ehrich), "Contextual Error Detection," Technical Report 70C-4, Department of Computer and Information Science, University of Massachusetts.

(with R. Ehrich), "Contextual Error Detection," short Technical Note presented at Spring Joint Computer Conference, Atlantic City, New Jersey, May 1971.

(with C. Foster, F. Stockton and C. Wogrin), "CHARGOGGAGGOGGMANCHAUGAGOGG-CHAUBUNAGUNGAMAUG - A Novel Multiply-by-Three Circuit," Technical Note Number 00019, Computer Science Program, University of Massachusetts, September 1970.

Research Grants:

Co-principal investigator with Professor C. Foster of grant from Control Data Corporation for Summer 1971. M10AA. $20,000.00 June 1, 1971 - July 31, 1971.

Co-principal investigator (R. Mallory, Principal Investigator, Dept. of Art) - Faculty Research Grant - A Computer Model of Aesthetic Criteria. $700.00. March 1971 - Fall 1971.

Research Projects:

Research Proposal submitted to National Science Foundation and Office of Naval Research: "A Study of Machine Language Utilization and Optimization,"

Research Proposal submitted to National Science Foundation, Office of Naval Research and National Aeronautics and Space Administration: "Automated Feature Selection and Use of Contextual Analysis in Pattern Recognition."

5. Continued - Riseman

Other Professional Activities:

Attended Spring Joint Computer Conference, Atlantic City, New Jersey, May 18-20, 1971.

Supervised research of several Ph.D. and Masters students.

5. Continued

Professor Sue N. Stidham, Assistant Professor of Computer Science

Publications:

"A Simulation of Jamming on the 122.8 Mhz Frequency" to appear in the proceedings of CASSAD '70 (Computer Aided System Simulation and Design, University of Houston, July 1970).

Research Projects:

Internal Field Calculations in a Dielectic Medium

Conferences Attended:

Fall Joint Computer Conference (Houston, Texas)

Spring Joint Computer Conference (Atlantic City, New Jersey)

Northeast Electronics Research And Engineering Meeting (Boston, Mass.)

Other Professional Activities:

Taught Computer Science 121 at Mount Holyoke College.

Held regular tutoring sessions for University students.

Advisor to Student Chapter, Association for Computing Machinery.

Advisor to two students in Bachelor's degree with Individual Concentration in Computer Science.

Library Liaison Officer for Computer Science Program.

6. Major accomplishments of the unit during Fiscal Year 1970-71:

(i) Increasing the capability of the computer systems laboratory, including establishment of a computer graphics PDP-15/VT facility, and strengthening of our PDP-11's.

(ii) Vigorous research activity, as attested to under Item 5 above.

(iii) Revision of requirements for M.S. degree, with important new emphasis on apprenticeship by replacing the thesis by a project.

(iv) Complete revision of course structure, with jettisoning of four courses, minor modifications in eight courses, and addition of 15 new courses. This revision not only signals a strengthening of the unit's traditional expertise in "real computers," but also signals its two new strengths in the areas of "theory of computation" and "cybernetics."

(v) A new Ph.D. program in Computer and Information Science has been proposed. It seems to be well received, and has already gained the formal approval of the Graduate Council.

(vi) Upgrading of our seminar program to include a number of world-famous authorities in Computer and Information Science.

(vii) Addition of excellent new faculty.

7. Special project or programs: A wide range of teaching, research and student-oriented activities.

8. Future plans and needs:

As spelled out in more detail in the Ph.D. Proposal for Computer Science (revision of May, 1971) the following are felt to be reasonable (though not inflexible) targets for the department:

(i) That by September 1975 there be 15 faculty in the Department of whom 9 should be in the "real computers" area, 4 in the "theory of computation" area, and 5 in the "cybernetics" area.

(ii) That expenditure for the computer science laboratory remain at its current <u>relative</u> level of departmental funding.

(iii) That sufficient space be made available in the Graduate Research Center to meet the above expansion.

UNIVERSITY COMPUTING CENTER

ANNUAL REPORT

1971

Introduction

The Computer usage on the campus grew this year in proportion to the increase in student body. The usage in research leveled off, probably reflecting the national changes in the support of research. This leveling off was most apparent in the batch use, particularly in a reduction of the number of new programs having need for large computation. On the other hand, the uses in educational activities increased considerably. The time-sharing system absorbs most of the educational load which in turn relieves the batch from the small job. Both trends tend to increase efficiency of operation.

The following material presents both data concerning the operation of the Center and descriptions of the changes and improvements that were accomplished during the year.

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UNIVERSITY COMPUTING CENTER
ANNUAL REPORT
Fiscal 1971

1. Appropriations

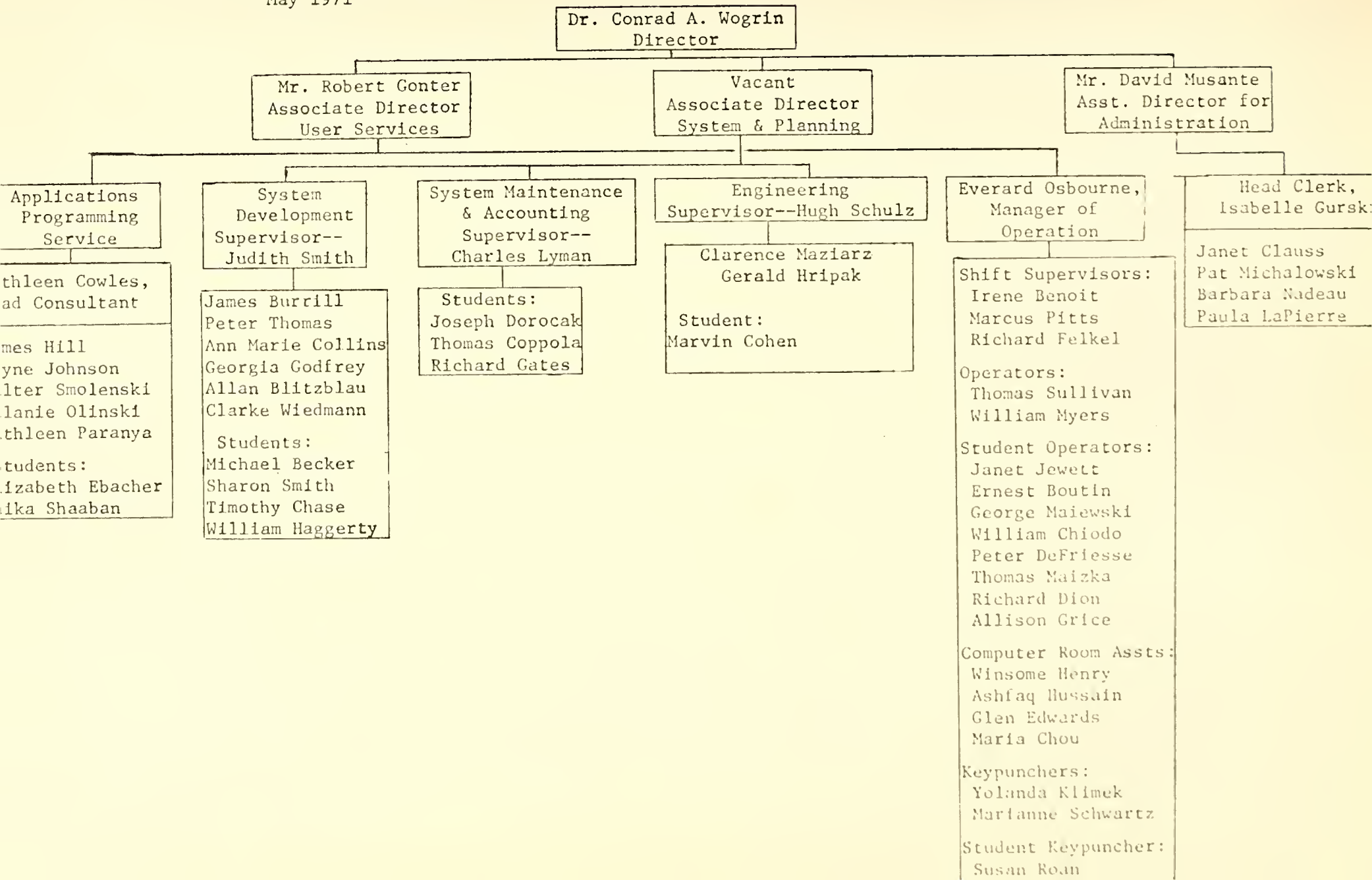
(Excluding Account 01-02 Salaries and Wages)

	1968-69	1969-70	1970-71
State Funds	$ 54,800	$ 71,300	$129,300
Trust Funds	248,300	575,800	633,900
Institutional Allowance Account	12,300	5,200	
Total	$315,400	$652,300	$763,200
Account 01-02, Salaries and Wages			
State Funds	$ 58,500	$ 64,500	$ 87,400
Trust Funds	145,900	240,500	241,900
Total	$204,400	$305,000	$329,300
TOTAL ALL ACCOUNTS	$519,800	$957,300	$1,091,600

2. Personnel by Job Title

	Sept. '68	Sept. '69	Sept. '70
Professor	1	1	1
Staff Associate	7	7	5
Staff Assistant	3	4	9
Sr. Elect. Specialist, Gr. 17	-	-	1
D. P. Superv. Optr., Gr. 15	-	1	1
Sr. Programmer, Gr. 15	1	1	1
Chief Stat. Mach. Optr., Gr. 13	1	1	3
Jr. Programmer, Gr. 12	2	2	2
Head Clerk, Gr. 11	-	-	1
Elec. Computer Optr., Gr. 10	2	2	1
Principle Clerk, Gr. 9	1	1	-
Sr. Stat. Mach. Optr., Gr. 8	1	1	1
Sr. Stat. Clerk, Gr. 8	-	-	1
Sr. Clerk Typist, Gr. 6	-	-	2
Stat. Mach. Optr., Gr. 5	1	2	2
Jr. Clerk Stenog., Gr. 4	3	3	1
TOTALS	23	26	32

3. Staff and Organization Chart
May 1971



4. Computer Usage

		1968-69	1969-70	1970-71
a. Total Number of Accounts		886	1,033	975
By Type:	Faculty	416	485	497
	Student	251	289	234
	Course	172	185	156
	Administrative	19	26	21
	Other	28	78	67
b. Departments Served		47	60	63
Number of Student Users per Semester		3,137	3,700	3,925
Faculty Users		590	610	607
c. Jobs Run Under Batch		78,400	81,301	75,950
Jobs Run Under Time Sharing		306,000	834,015	1,300,000
Time-Sharing Signons			159,447	147,000

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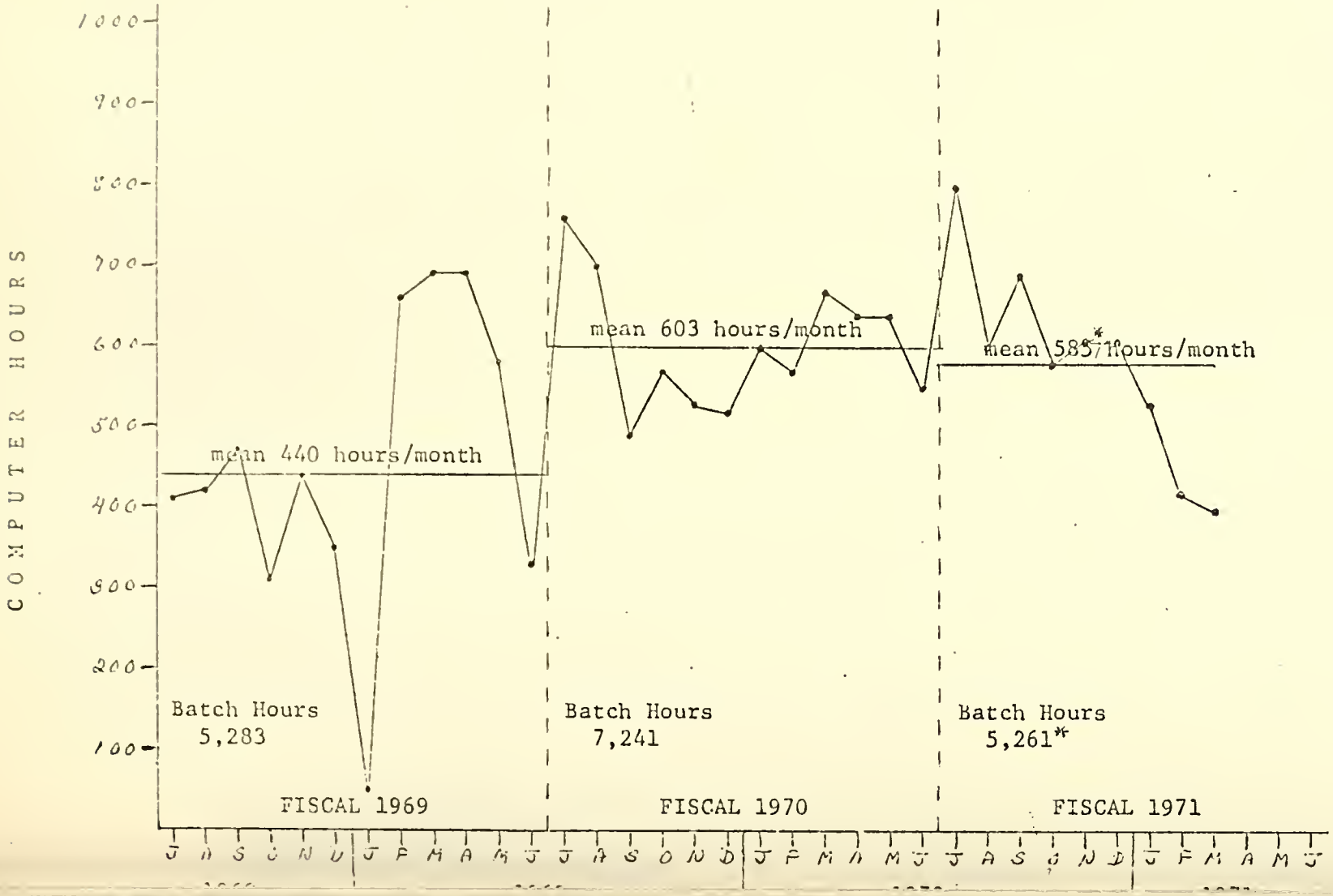
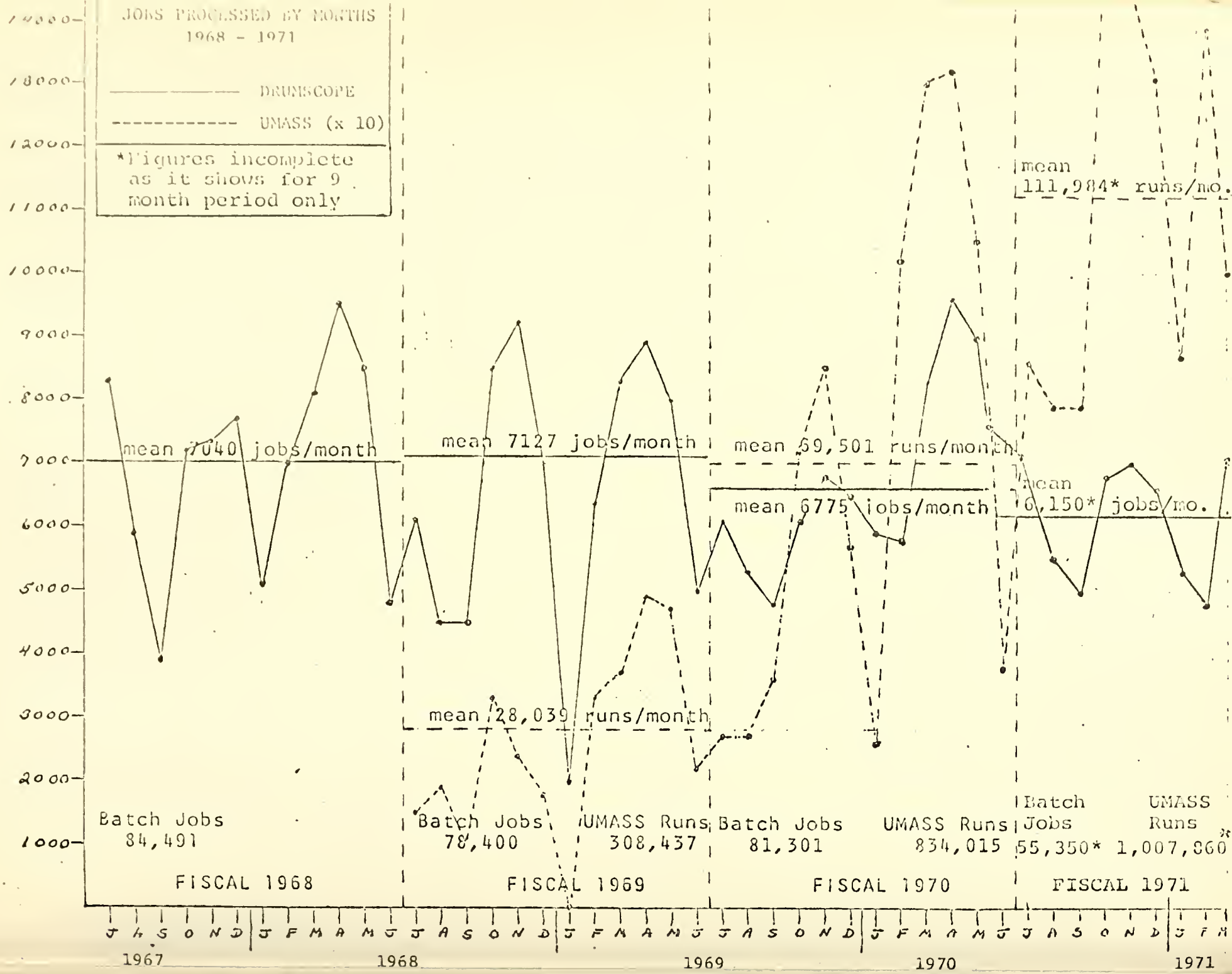
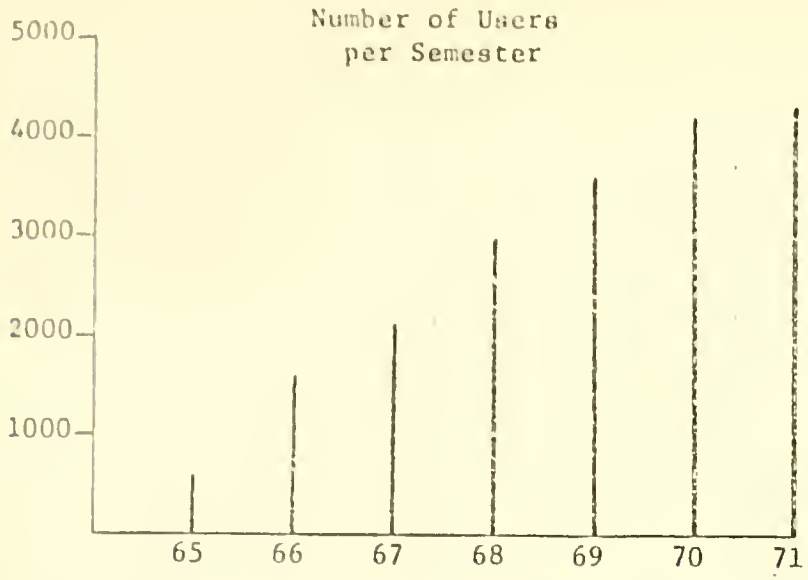
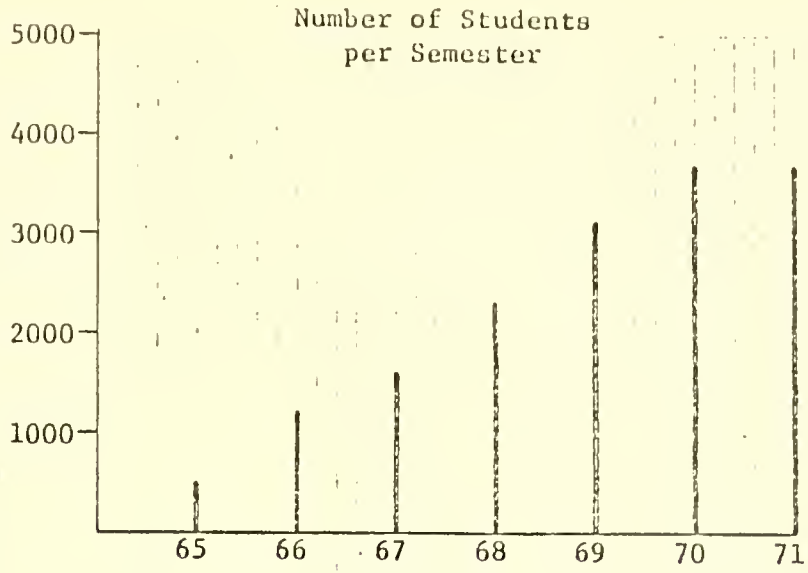
UNIV. COMPUTING CENTER
Total Computer Hours
for Batch Processing

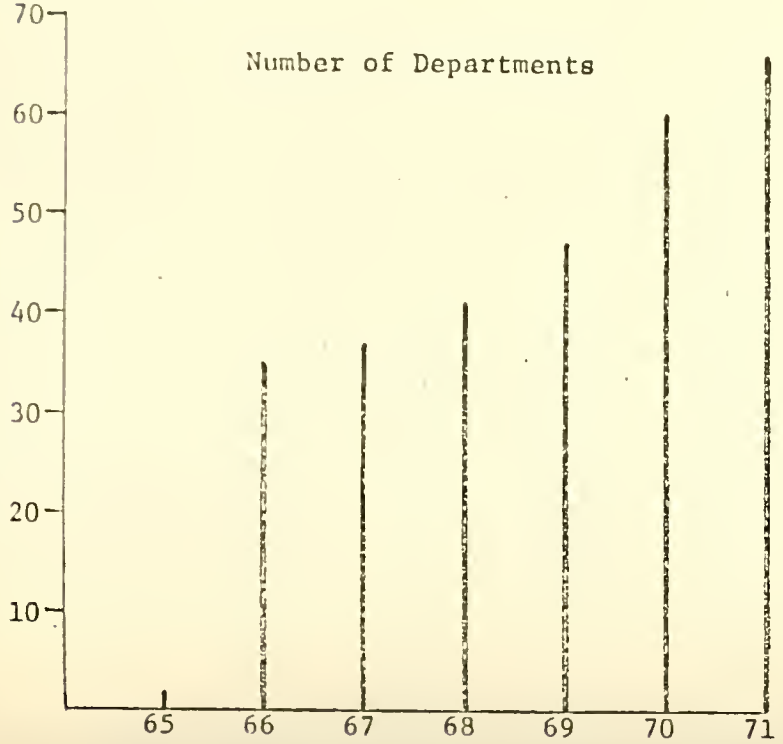
*Figure incomplete as it shows for 9 month period

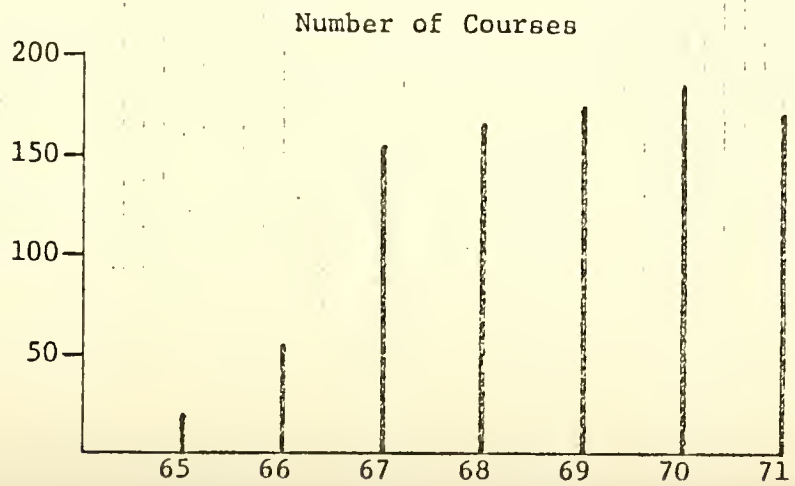



JOBS PROCESSED BY MONTHS
1968 - 1971
DRUMSCOPE
UMASS (x 10)
*Figures incomplete as it shows for 9 month period only
JOBS/RUNS PROCESSED
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
mean 7040 jobs/month
mean 7127 jobs/month
mean 69,501 runs/month
mean 6775 jobs/month
mean 111,984* runs/mo.
mean 6,150* jobs/mo.
mean 28,039 runs/month
Batch Jobs 84,491
Batch Jobs 78,400
UMASS Runs 308,437
Batch Jobs 81,301
UMASS Runs 834,015
Batch Jobs 55,350*
UMASS Runs 1,007,860*
FISCAL 1968
FISCAL 1969
FISCAL 1970
FISCAL 1971
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M
1967
1968
1969
1970
1971


Number of Users
per Semester
5000
4000
3000
2000
1000
65
66
67
68
69
70
71


Number of Students
per Semester
5000
4000
3000
2000
1000
65
66
67
68
69
70
71


Number of Departments
70
60
50
40
30
20
10
65
66
67
68
69
70
71


Number of Courses
200
150
100
50
65
66
67
68
69
70
71

PROFESSIONAL ACTIVITIES

1. Professional Activities:

Wogrin, Conrad A.; Director

-NERComP Inc., Member of the Board of Trustees

-"APL Conference," Chairman of Planning Committee, University of California at Berkeley (April 1971)

-Committee on Academic Information Systems, Board of Higher Education, Chairman

Gonter, Robert H.; Associate Director

-Sub-Committee on Statistics, School of Agriculture, Member

-5-College Committee for Computer Assisted Instruction in Foreign Languages (CAI), represented University Computing Center at University of Illinois, CAI Laboratory (March 3-5, 1971)

Schulz, Hugh C.; Engineer

-Attended Control Data 3800 School in Minneapolis, Minnesota

Maziarz, Clarence J; Engineer Assistant

-Attended Control Data Institute, 841 Disk Drive and Controllers

Hripek, Jerry; Engineer Assistant

-Attended TEMPO1 Computer School

2. Conferences or Meetings Attended:

Wogrin, Conrad A.; Director

Oct. 17, 1970	ASEE Conference (American Society for Engineering Education)--panel member--Durham, New Hampshire.
Oct. 26-28, 1970	FOCUS-4 (Fourth Semi-Annual FOCUS Conference),Washington, D.C.
Nov. 4, 1970	NEREM70 (the IEE-Northeast Electronics Research & Engineering Meeting), Boston, Ma.
Dec. 15, 1970	FORTRAN Workshop, University of New Hampshire, Durham; luncheon speaker on UMASS system and Computer Science.
Apr. 20-21, 1971	APL Conference, University of California, Berkeley.

Gonter, Robert H.; Associate Director

Oct. 26-28, 1970	FOCUS-4, CDC Users Group, Washington, D.C.
Oct. 28-29, 1970	Instrument Society of America, Philadelphia, Pennsylvania
Apr. 5-7, 1971	Workshop on System Performance Evaluation, Harvard University, Cambridge, Massachusetts
May 24-26, 1971	FOCUS-5, CDC Users Group, St. Paul, Minnesota

Smith, Judith; Program Supervisor

Apr. 20-21, 1971	APL Conference, University of California, Berkeley

Lyman, Charles; Systems Programmer

October 26-28, 1970	FOCUS-4, CDC Users Group, Washington, D.C.
May 24-26, 1971	FOCUS-5, CDC Users Group, St. Paul, Minnesota

Burrill, James; Systems Programmer

Apr. 20-21,	APL Conference, University of California, Berkeley

Paranya, Katharine; Applications Programmer

Feb. 4-5, 1971	American Educational Research Associates Conference, New York, New York

Blitzblau, Allan; Systems Programmer

June 11, 1971	ACM Conference on "Advances in Computing at SUNY, Stony Brook.

3. Papers or Lectures Presented:

Wogrin, Conrad A.; Director

Oct. 15, 1970	Panel discussion on program entitled Is Privacy Dead?--Channel 8--regarding data banks and the invasion of privacy; Amherst
Feb. 27, 1971	Lectured at the University of Denver, Colorado

Gonter, Robert H.; Associate Director

Oct. 27, 1970 (cont.)	Paper presented at FOCUS-4 entitled An Investigation of CDC 3600 Drum SCOPE Interrupts (Washington, D.C.)

Feb. 25, 1971	Paper presented entitled Computer Potentials for Research, Biochemistry Seminar
May 25, 1971	Paper presented at FOCUS-5 entitled Characteristics of Jobs Processed in a University Computing Center (St. Paul, Minnesota)

Cowles, Kathleen H.; Consultant

1971	Informal Presentation at AERO on Discourse Analysis

4. Papers Published:

Gonter, Robert H.; Associate Director

a. Conditional Interpretation of Operation Codes, co-authored with Caxton C. Foster, IEEE, Vol. C-20, No. 1, January 1971

b. Measures of Op. Code Utilization, co-authored with Caxton C. Foster and E. M. Riseman, IEEE, Vol. C-20, No. 5, May 1971

Burrill, James; Systems Programmer

a. Published two communications to the APL Quote Quad (March and June 1971)

Wiedmann, Clarke

a. Introduction to APL, author, (re-printed January 7, 1971, for use at UMass Computing Center)

b. Using UMASS-APL Workspaces, January 1971

c. UMASS-APL Page Editing Functions, April 1971

6. Accomplishments for Year:

During this year, the University Computing Center made several changes or additions to the computing machinery to both enlarge and improve the services from the Center.

The three major changes were:

a. Replacing one CDC 3600 with sixty-five thousand words of memory by a CDC 3800 with ninety-eight thousand words of memory. The 3800 is much faster than the 3600 and has additional features such as interleaved memory, hardware for address relocation, and priority scanning of memory access.

   The change was accomplished with only three days of complete shut down and one week of partial operation.

   With the new machine, time-sharing will be enlarged by thirty percent and batch processing for large jobs that work overnight will be improved by about fifty percent.

b. Acquisition of and development of the software for the TEMPO I computer which will replace the PDP-8 680 system for handling the communications. With the TEMPO, the ports will be expanded from 64 to 96. Each port on the TEMPO will be able to accept any terminal device with transmission speeds of up to 120 characters per second. With the PDP-8, the system had 48 ports for 10 characters per second terminals and 16 ports for 15 character per second terminals.

   In addition to the general ports, some of the ports can be used at speeds as high as 480 characters per second. The machine provides the basis for much improved services in the future.

c. A new disk system consisting of four drives (expandable to 16) replaced the disk system consisting of five drives. The new disk drives accept disk packs having more than four times the storage capacity of the old drives at about the same price. There is also a significant improvement in speed and reliability. The total storage space available to users has increased from 40 million characters to 110 million characters.

The hardware changes have led to software improvements and projects for added services in the coming year. The additions to both the hardware and software of the Center should provide both better and more economical service and the ability to keep up with the growing requirements of the academic community.

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A REVIEW OF ACTIVITIES -- 1966 - 1971

WATER RESOURCES RESEARCH CENTER
UNIVERSITY OF MASSACHUSETTS - AMHERST

BERNARD B. BERGER, DIRECTOR

PREFACE

Relevancy to important regional problems is the keynote of this University's water resources research program. We have many such problems. How to distribute the limited funds available optimally among the research tasks is in itself a highly relevant question that deserves research.

The fact is the goals to be served by water resources planning and development are not static -- social values change and new research needs emerge. But the existing goals do not disappear. Inevitably, planning for use of the water resource becomes more and more complex. This is reflected in part in an increasing interest in the way attitudes on water use form and in how they shape processes of decision-making.

Problems of water quantity augmentation and regulation and water quality protection and management continue to challenge us. However, the spectrum of needed research skills, which traditionally spans the natural and life sciences, is increasingly being extended into the social sciences, spurred in large measure by encouragement from the Office of Water Resources Research. One may note in particular a new emphasis on the need for integrating water resources into a generalized methodology for land use planning and management.

The questions now being asked present an imposing set of tasks to Universities. They include a special need to find ways of making the results of research available for use as promptly as possible. So far, the response has generally been fragmented. This is not because the specialized skills, the imaginative ideas, and the will to work on important problems do not exist. Rather it results from a lack of adequate financial support for the necessary work. Given this support, the University of Massachusetts Water Resources Research Center will be ready to make its full contribution to the solution of water resources problems that concern this State and region.

INTRODUCTION

The purpose of this report is to provide information on the work of the Center from its inception in late 1965 to the Spring of 1971. The report describes the Center's goals and the nature of research, training, and public service relevant to these goals. It presents a statement on problems in Massachusetts requiring research effort and it includes a brief digest of all Center projects, past and current.

The Water Resources Research Center at the University of Massachusetts was established in 1965 on enactment of the Water Resources Research Act of 1964, Public Law 88-379. This Act, which provides for a research institute at a State University in each State and Territory, seeks to strengthen State and regional programs of research on important problems of water resources and to prepare persons in various disciplines for careers in the water resources fields. The Act is administered by the Office of Water Resources Research in the Department of the Interior.

The objective of the Water Resources Research Center at the University of Massachusetts is threefold:

(1) To define existing and emerging water resources problems and to support research directed to their solution.

(2) To assist in training professional workers for careers in water resources fields.

(3) To assist agencies and individuals concerned with decisions on protection and use of the State's water resources.

The University is guided in its program development by a University Committee and an Advisory Council. The function of the University Committee is to review the Center's program and plans and to assist the Director in advancing the Center's goals. The specific functions of the Committee include: evaluation of policy and procedure on handling research project proposals; review of project completion reports for adequacy and suitability for publication; participation in planning of Center-sponsored conferences; participation in planning of Center-sponsored courses and educational programs.

The current membership of the University Committee on the Water Resources Research Center is the following:

Professor Bernard B. Berger, Chairman. Director, Water Resources Research Center

Dr. M. H. Appley, Dean, University of Massachusetts Graduate School

Dr. Carl A. Carlozzi, Department of Forestry and Wildlife Management

Dr. Haim B. Gunner, Head, Department of Environmental Sciences

Dr. Irving Howards, Department of Government

Dr. Robert E. McGarrah, Director, Center for Business and Economic Research

Dr. Robert P. Mortlock, Department of Microbiology

Dr. Fuad M. Safwat, Department of Biology, U.M.-Boston

Mr. Ernest A. Snow, Chemist, Massachusetts Department of Public Health, Amherst Campus

Dr. Merit P. White, Head, Department of Civil Engineering

Dr. Jean B. Wyckoff, Head, Department of Agricultural and Food Economics

Professor Ervin H. Zube, Head, Department of Landscape Architecture

The following persons served on the University Committee in the past:

Dr. R. A. Damon, Jr., Department of Veterinary and Animal Sciences

Dr. T. H. Feng, Department of Civil Engineering

Professor G. R. Higgins, Department of Civil Engineering

Dr. R. W. Kleis, Head, Department of Agricultural Engineering

Dr. Warren Litsky, Head, Institute of Agricultural and Industrial Microbiology

Dr. R. B. Livingston, Department of Botany

Dr. E. C. Moore, Dean of the University of Massachusetts Graduate School (until September 1, 1968)

Dr. W. S. Motts, Department of Geology

Dr. J. L. Roberts, Department of Zoology

Dr. Andrew J. W. Scheffey, Department of Forestry and Wildlife Management

The Advisory Council provides guidance to the Water Resources Research Center in the following ways: identifies research needs to which the Center should respond; identifies educational needs and evaluates programs responsive to evolving water resources problems; identifies problem areas to which the Center should respond in terms of public service functions; advises the Center on improvement of communications and on relationships with public and private organizations concerned with water resources; advises the Center on additional matters of importance as timely and appropriate.

The current membership of the Advisory Council on the Water Resources Research Center is the following:

Dr. M. H. Appley, Chairman. Dean, University of Massachusetts Graduate School

Professor Bernard B. Berger, Director, Water Resources Research Center

Mr. Mark Abelson, Regional Coordinator, U.S. Department of the Interior

Professor G. R. Higgins, Department of Civil Engineering

Mr. C. F. Kennedy, Director and Chief Engineer, Division of Water Resources, Massachusetts Water Resources Commission

Dr. Warren Litsky, Head, Institute of Agricultural and Industrial Microbiology

Dr. R. B. Livingston, Department of Botany

Dr. W. S . Motts, Department of Geology

Mr. Christopher Percy, Executive Director, Connecticut River Watershed Council

Dr. C. N. Sawyer, Director of Research, Metcalf and Eddy Engineers

The following persons served on the Advisory Council in the past:

Dr. R. A. Damon, Jr., Department of Veterinary and Animal Sciences

Mr. E. R. Foster, Executive Director, Connecticut River Watershed Council

Mr. M. E. Graf,Director and Chief Engineer, Division of Water Resources, Massachusetts Water Resources Commission -- (presently Staff Director, New England River Basins Commission)

Dr. E. C. Moore, Dean of the University of Massachusetts Graduate School (until September 1, 1968)

Mr. E. W. Webber, Chief, Natural Resources Program, New England Council for Economic Research and Development

Dr. Richard A. Damon served as Director of the Water Resources Research Center from its inception in 1965 until April, 1966 when the current Director, Bernard B. Berger, was appointed. Professor Berger has served in this position since that time except for the period October, 1968 to October, 1969 when he was assigned as Water Resources Specialist, Office of Science and Technology in the Executive Office of the President. Dr. Warren Litsky served as Acting Director during the year Professor Berger spent in Washington, D.C.

The Water Resources Research Center is a component of the University of Massachusetts Graduate School. The Center's staff is as follows:

Professor Bernard B. Berger, Director

Mr. Arnold M. Schneider, Administrative Assistant

Mrs. Evelyn D. Ruddeforth, Secretary

Mrs. Barbara J. Baker, Secretary

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APPENDIX II,	Abstracts of Allotment Grant, Matching Grant and Title II Projects	34
APPENDIX III,	Listing of Publications	85

A LOOK AHEAD

Current problems and research needs will not just fade away with time. Many will get worse and, in all likelihood, new problems will emerge. The task of the research planner is to anticipate new problems and to bring an adequate research resource to bear on them in time to insure prudence of future decisions. The key word is "anticipation". The clue is a knowledge of social trends and a sensitivity to social issues.

Five years ago the protection of ecological systems was beginning to emerge as a social value of special importance. It has since attained the highest national priority in recent acts of Congress and in reorganization of Federal agencies. This concern with environmental quality reflects a profound public fear that past public policy in use of the Nation's water resources may well have produced consequences that are in some respects irreversible and perhaps even disastrous. It may, therefore, be of interest to note that in 1960, few would have predicted the current preoccupation with environmental quality deterioration. However, there is little doubt that this public concern will influence all future planning for the use of our water and related land resources.

One may predict now that the public demand for conservation and prudent use of our resources will become increasingly more insistent. And one may be sure that in the years to come, this concern will express itself in a search for practicable techniques for planning on a regional or river-basin scale. Whatever the new problems of the future, foreseeable or not, we may be certain that regionalization will be a common element in their solution. We may be equally sure that citizen participation in planning will be an essential ingredient in the development of action programs.

A State University must be expected to play a significant role in developing and evaluating systems for planning and management of the water resource. To say this, however, does not mean that it will inevitably be accomplished effectively. A number of conditions must be met before satisfactory performance may be assured. These include an experienced and committed intellectual resource, a well equipped research facility, a sensitivity to the need for useful changes in institutions concerned with planning and management, and the confidence of public agencies, citizen groups, and private practitioners.

In a real sense, these conditions are present at the University of Massachusetts at Amherst. A faculty representing the relevant natural and social sciences has been engaged over the past five years in a broad spectrum of research projects. Groups of scientists and engineers are working cooperatively toward objectives of joint interest. The troublesome barrier of interdisciplinary communication is being reduced.

Arrangements for cooperative research have been developed with other universities in the State of Massachusetts and with the State universities in other New England States. We are approaching the time when the full research resources of this State and region may be focussed on problems of outstanding concern.

The process of tooling up -- a phase as essential to interdisciplinary research planning as it is to automobile construction -- is well advanced. This University in particular is ready, able and willing to undertake research tasks that respond to the immediate and long-term needs of the Commonwealth of Massachusetts.

WATER RESOURCES RESEARCH CENTER

UNIVERSITY OF MASSACHUSETTS

A REVIEW OF ACTIVITIES -- 1966 - 1971

The Center's primary efforts have been devoted to support of research. Since preparation of professional personnel for the water resources fields is closely associated with University research programs, the provision of training opportunities also represents an important element of this Center's program. As a result of such research and training support, the University faculty who are associated with the Center are called upon to provide a variety of services for many public agencies. The following review of the Center's activities therefore covers these phases of the Center's programs -- Research, Training, Public Service.

RESEARCH

Most of the Center's research projects are supported by the Allotment Grant Program, Section 100 of the Water Resources Research Act of 1964. In addition, a substantial number of projects are supported by Matching Grants provided under Section 101 of the Act. One project is being supported under the provision of the Act's Title II. All projects initiated by or submitted to the Center are evaluated for research merit and relevancy by University faculty and when desirable by outside consultants.

In addition, projects are discussed informally with the University Committee on the Water Resources Research Center, the Advisory Council of the Water Resources Research Center, the Massachusetts Water Resources Commission, and the staff of the New England River Basins Commission. The views of the Office of Water Resources Research are routinely sought before a proposal is put into final shape for submission.

A description of major water resources problems in Massachusetts, which has been widely distributed in this State, is included as Appendix 1. A statement on the objectives, accomplishments and current status of all Center-related research projects is included as Appendix II. A listing of Center publications is included as Appendix III.

Allotment Grant Programs

While all research projects of the Center must satisfy the criteria of research merit, the special objectives of Allotment Grant projects are the following:

1. To provide practical solutions to clearly defined State problems.

2. To provide seed support to research that promises to have significant State and regional implication for water resource development.

3. To provide investigators in fields not heretofore associated with water resources opportunities to adapt their specialized knowledge to water resources problems.

4. To provide this University useful opportunities for collaboration with other Universities.

All of the Allotment Grant projects with only a few exceptions fall into these categories.

Because of the clearly defined goals of projects falling within the first of the above categories, the research effort frequently yields results that are immediately applicable to the solution of important State problems. Examples of such accomplishments are presented in the following projects:

HYDROLOGICAL STUDIES IN MASSACHUSETTS. A-003-MASS. Principal Investigator -- Professor G. R. Higgins, Department of Civil Engineering.

Problem: The increasing demand for water in Massachusetts makes it more important than ever that data on run-off from catchment areas be as reliable as possible. Assumptions on run-off based on studies in the distant past, and the rule-of-thumb predictive techniques derived from these assumptions are no longer adequate. The drought experience of 1962-66 has demonstrated the general inadequacy of traditional assumptions on water yield. The need for refinement of technique emphasizes the water loss by evaporation, largely ignored in the past in this part of the country, must be fitted into procedures for predicting reliable water yields.

Recommended Solution: Reliable storage-yield curves were developed for every major stream and tributary in Massachusetts. These curves make it possible for planners and water resource engineers to predict with more confidence than before (a) the water yield that a given drainage area may produce; (b) the size of reservoir required to meet a given rate of water demands; and (c) the optimum size of reservoir to be provided for a given drainage area. The benefits resulting from this research will be realized in two ways: (a) the reliability of the storage-yield curves will make detailed expensive studies of specific catchment areas less necessary; (b) long-range planning for public water supply will be advanced. The publication containing the data was distributed to every consulting engineer in Massachusetts concerned with water resource development, and to all public agencies having responsibilities in this field.

DEVELOPMENT OF METHOD FOR INCREASING THE EFFICIENCY OF WATER USE IN CRANBERRY CULTURE. A-005-MASS. Principal Investigator - Professor John S. Norton, Cranberry Experiment Station, University of Massachusetts.

Problem: Cranberry production, a major agricultural crop in Massachusetts, requires an abundant supply of water. Cranberry bogs must be flooded in the winter to protect vines from desiccation and in the spring to control the time of fruit ripening. Flooding is also practiced to control insect pests and to facilitate bog clean up following the harvest. A growing practice is the flooding of the bog to float cranberries ready for harvest. The latter in particular

is important since laboratory studies show that the cranberry yield of "water-picked" plots may be nearly 50 percent greater than the yield of "dry-picked" plots. In all, some 15 floodings annually may be required. Cape Cod, the area in which cranberry production is located, is not water-rich. To assure maximum cranberry yields, highly efficient methods of water conservation must be developed.

Recommended Solution: A system of diking was developed with structural characteristics which are readily adaptable to the uneven topography common to cranberry bogs on Cape Cod. Flooding is made possible with minimum use of water. The diking materials resist seepage loss, washout, and loss by muskrat damage. Conservation of water by the efficient, flexible system of diking recommended will provide increased assurance of the availability of water for "water-picked" cranberry harvesting. It is estimated that such harvesting increases the yield from 10 - 35 percent.

SUB-SURFACE IRRIGATION OF TURF AREAS -- NOZZLE DESIGN AND SPACING. A-015-MASS. Principal Investigator -- Dr. L. F. Whitney, Department of Agricultural Engineering.

Problem: Irrigation of crops and turf areas by sub-surface introduction of water has long been of interest to researchers and growers. It has been reported that a saving in water usage of up to 40 percent may be possible as a result of reduction of evaporation and leaching losses. In addition, the introduction of liquid fertilizers, herbicides, and other chemicals into the root zone will improve the efficiency in use of these materials and minimize any adverse effect on environmental quality. The need for improved irrigation techniques is evident in the enormous demand for water by agriculture, estimated at 111 billion gallons per day (1965). Despite the clear advantages associated with sub-surface irrigation, its wide use has been checked by failure to solve problems due to clogging of the underground water distribution systems.

Recommended Solution: A plastic tubing with a plastic insert nozzle has been produced which may find widespread use in the sub-surface application of liquids. This nozzle, a critically important component of the system, is designed in a manner to avoid the common problems of fouling and plugging. This special nozzle is an injection-molded plastic insert which

pierces the plastic pipe wall such that the inlet to the orifice is at the point of maximum velocity within the pipe. An essential part of the nozzle is an external protection device for the orifice to provide free flow under all conditions. Directions for spacing of orifices have been prepared for common soil profiles and soil types. The utility of this plastic distribution pipe is now being commercially tested.

Seed support for promising research may provide a basis for obtaining funds from State and other agencies and from the OWRR under Section 101 of the Water Resources Research Act of 1964. Examples of projects which benefitted from the multiplier effect of such seed support are the following:

HYDROLOGICAL STUDIES IN MASSACHUSETTS. A-003-MASS. Principal Investigator -- Professor G. R. Higgins, Department of Civil Engineering. (Appendix II, Page 36).

An expanded project, WATERSHED RESPONSE TO HYDROLOGIC INFLUENCES, B-008-MASS (Appendix II, Page 73) was approved for funding under Section 101 of the Water Resources Research Act. The total project budget for the Matching Grant was $78,266, with $38,600 from the OWRR and $39,666 from Non-Federal sources.

EFFECTS OF ORGANIC DEPOSITS IN WATER QUALITY IN IMPOUNDMENTS. A-011-MASS. Principal Investigator -- Dr. T. H. Feng, Department of Civil Engineering. (Appendix II, Page 45).

An expanded project, CONTROL OF BENTHIC DEPOSITS IN LAKES, B-005-MASS (Appendix II, Page 71) was approved for funding under Section 101 of the Water Resources Research Act. The total project budget for the Matching Grant was $73,860 with $36,900 from the OWRR and $36,960 from Non-Federal sources.

A related new three-year project, SUPPRESSION OF RECYCLING OF NUTRIENTS IN LAKES, is being supported solely by the Massachusetts Division of Water Pollution Control at a total budget level of $142,500.

A CASE STUDY OF ATTITUDES OF LOCAL DECISION-MAKERS TOWARD WATER POLLUTION ABATEMENT IN SELECTED MASSACHUSETTS COMMUNITIES ON THE CONNECTICUT RIVER. A-022-MASS. Principal

Investigator -- Dr. Robert A. Shanley, Department of Government. Appendix II, Page 54).

The Allotment Grant project led to the development of INSTITUTIONAL PATTERNS FOR EVOLVING REGIONAL PROGRAMS FOR WATER RESOURCE MANAGEMENT, B-003-MASS (Appendix II, Page 68) approved for funding under Section 101 of the Water Resources Research Act. The total project budget was $107,342 with $53,600 from OWRR and $53,742 from Non-Federal sources.

It also led to the development of ATTITUDES, VALUES AND PERCEPTIONS IN WATER RESOURCE DECISION-MAKING WITHIN A METROPOLITAN AREA, B-018-MASS (Appendix II, Page 81) approved for funding under Section 101 of the Water Resources Research Act. The total project budget was $114,100 with $56,500 from OWRR and $57,600 from Non-Federal sources.

Another related project is FORMATION OF PUBLIC POLICY ON ISSUE OF OUT-OF-BASIN DIVERSION OF CONNECTICUT RIVER FLOODWATERS TO BOSTON METROPOLITAN AREAS, C-2169 (Appendix II, Page 83) funded under Title II of the Water Resources Research Act at a level of $30,000.

The scope of the Center's Allotment Grant Projects and the variety of disciplines associated with these projects are shown in Table 1, "Distribution of Projects According to the Categories of the Federal Council for Science and Technology (FCST)" and Table II, "Distribution of Faculty and Other Professional Staff Associated With Center-Supported Projects According to Discipline". It will be noted that the 37 projects supported by Allotment Grant fell in 18 of the Categories and Sub-Categories defined by the Federal Council for Science and Technology. This broad distribution of research subjects is reflected also in the fact that the 69 professional workers engaged on these projects represented 25 disciplines.

In view of the scope of the Center's research program, the University is now well prepared to undertake broadly based interdisciplinary research on important State and regional problems. Such projects supported by Matching Grant and Title II funds are already under way. (Appendix II, Pages 68 - 84).

Because the problems presented by regional water resources planning and management are growing, the University of Massachusetts Water Resources Research Center

TABLE I

DISTRIBUTION OF PROJECTS ACCORDING TO THE CATEGORIES

OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY (FCST)

FCST Category	Number of Projects Supported			
	Allotment Grant-100	Matching Grant-101	Title II	Total
I. NATURE OF WATER				
B. Aqueous Solutions	1	0	0	1
II. WATER CYCLE				
A. General	1	0	0	1
D. Evaporation and Transpiration	1	0	0	1
F. Groundwater	1	0	0	1
H. Lakes	0	1	0	1
J. Erosion and Sedimentation	1	0	0	1
III. WATER SUPPLY AUGMENTATION AND CONSERVATION				
C. Use of Water of Impaired Quality	1	0	0	1
F. Conservation in Agriculture	1	0	0	1
IV. WATER QUANTITY MANAGEMENT AND CONTROL				
A. Control of Water on the Land	1	0	0	1
B. Groundwater Management	3	0	0	3
C. Effects of Man's Activities on Water	1	0	0	1
V. WATER QUALITY MANAGEMENT AND PROTECTION				
A. Identification of Pollutants	1	0	0	1
B. Sources of Pollution	2	0	0	2
C. Effects of Pollution	4	0	0	4
G. Water Quality Control	3	0	0	3
VI. WATER RESOURCES PLANNING				
A. Techniques of Planning	4	2	0	6
B. Evaluation Process	4	0	0	4
C. Cost Allocation, Sharing, Pricing, Repayment	0	1	0	1
E. Water Law and Institution	1	2	1	4
G. Ecologic Impact of Water Development	6	4	0	10
VII. RESOURCES DATA				
A. Network Design	0	1	0	1
TOTALS	37	11	1	49

TABLE II

DISTRIBUTION OF FACULTY AND OTHER PROFESSIONAL STAFF ASSOCIATED WITH CENTER-SUPPORTED PROJECTS ACCORDING TO DISCIPLINE

Discipline	Total Faculty and Professional Staff
Anthropology	1
Agricultural Engineering	3
Aquatic Biology	5
Civil Engineering	3
Economics	5
Education	2
Environmental Engineering	1
Environmental Science	1
Forestry	2
Geology	5
Hydrology	3
Industrial Engineering	4
Landscape Architecture	3
Management Science	1
Microbiology	6
Physical Chemistry	1
Plant Biology	6
Political Science	8
Oceanography	1
Organic Chemistry	1
Regional Planning	1
Sociology	1
Soils Chemistry	1
Wildlife Biology	3
Zoology	1
	69

has sought to stimulate and support relevant research in other Colleges and Universities in Massachusetts and to collaborate as appropriate in the conduct of such research. The following Universities are conducting or have conducted research with funding support from the Water Resources Research Center:

Clark University

THE ECOLOGICAL SIGNIFICANCE OF CELLULOLYTIC BACTERIA IN QUABBIN RESERVOIR. A-007-MASS. Principal Investigator -- Dr. John T. Reynolds, Department of Bialagy. (Appendix II, Page 41).

Smith College

A STUDY OF THE RELATIONSHIP OF THE VASCULAR PLANT FLORA AND VEGETATION OF THE MILL RIVER AND ITS FLOODPLAIN IN NORTHAMPTON AND WILLIAMSBURG, MASSACHUSETTS TO PATTERNS OF LAND USE AND TO THE PRESENCE OF THE FAMILY PSEUDOMONADACEAE. A-026-MASS. Principal Investigator -- Dr. Elizabeth D. Rabinton, Department of Biological Sciences. (Appendix II, Page 57).

Springfield College

SURFACE WATERS OF A SMALL CITY. A-027-MASS. Principal Investigator -- Dr. John W. Brainerd, Department of Biology. (Appendix II, Page 58).

Northeastern University

WATER RESOURCES POTENTIAL OF AN URBAN ESTUARY. A-028-MASS. Principal Investigator -- Dr. John F. Cochrane, Department of Civil Engineering. (Appendix II, Page 59).

Tufts University

THE ROLE OF COASTAL MARSHES IN PHYSICAL RESTRICTION OF SEAWARD FLOW OF FRESH GROUND WATER. A-036-MASS. Principal Investigator -- Dr. Norton H. Nickerson, Department of Biology. (Appendix II, Page 65).

(In addition, the Massachusetts Institute of Technology, under a Matching Grant from OWRR arranged through the Water Resources Research Center, completed its research on PLANNING FOR CAPACITY EXPANSION OF WATER DISTRIBUTION NETWORKS, B-014-MASS, Principal Investigator -- Dr. John C. Schaake, Department of Civil Engineering. This project is described in Appendix II, Page 78).

Matching Grants

Matching grants are generally sought for research projects that have special regional significance, require interdisciplinary effort, are focussed particularly on improving existing techniques of water resource planning and management, and are beyond the support capability of the Allotment Grant program. Descriptions of the Center's projects supported by Matching Grants are given in Appendix II, Pages 68 - 82. Examples of such projects are given below:

ENHANCEMENT OF ECOLOGIC AND AESTHETIC VALUES OF WETLANDS ASSOCIATED WITH INTERSTATE HIGHWAYS. B-010-MASS. Principal Investigator -- Dr. Carl A. Carlozzi, Department of Forestry and Wildlife Management.

Problem: Approximately one-half of the Nation's interstate highways have been completed and these often affect the land and water in undesirable ways. Surface and ground waters are being altered, wildlife and fish habitats disturbed, and the landscape spoiled. With many more thousands of miles of highways to be built, these impairments will become increasingly evident. Institutional and legal structures are relatively ineffectual at this time in dealing with this problem.

Recommended Solutions: Design criteria have been developed which will permit the construction of planned small-water-impoundments and wildlife habitats in conjunction with interstate highway construction. These newly created water resources would provide for the establishment of managed recreational fishing, hunting, and swimming as well as scenic areas for use by the public. Legal institutional measures are recommended to provide tools with which to implement aesthetic and ecological criteria.

A METHODOLOGY FOR PLANNING OPTIMAL REGIONAL WASTE MANAGEMENT SYSTEMS. B-011-MASS. Principal Investigators-- Dr. D. D. Adrian, Department of Civil Engineering, and Drs. R. J. Giglio, F. C. Kaminsky and R. F. Rikkers of the Department of Industrial Engineering.

Problem: Experience in water pollution control has demonstrated the importance of the regional, or basin-wide approach, to planning as opposed to the community by community approach. The advantages of the regional approach are significant: economies of scale, improved quality of system management, increased flexibility in handling special loading problems, and greater adaptability to new land use developments. Two problems stand in the way of regional water pollution control: an inadequate technological base for the design of an optimized system, and a widespread reluctance on the part of local communities to yield decision-making authority to a regional management agency. This project has been directed to the first of these problems.

Recommended Solutions: Procedures have been developed for designing a regional system of municipal waste interceptors and treatment plants which will meet a specified stream quality standard at minimum overall cost. These procedures provide for: improved predictions of population densities within sub-areas of the region; most desirable location, size and nature of new treatment units; most rational use of existing facilities; and optimal location and size of intercepting sewers. The proposed set of techniques was evolved for regions similar to the Springfield, Massachusetts metropolitan area. Hundreds of such developing metropolitan areas exist in the Nation.

Title II Grants

Because of the great interest in the proposal to divert Connecticut River flood waters to the Quabbin Reservoir, the source of public water supply for the metropolitan area of Boston, and the uncertain base for future decisions on such proposals, the Water Resources Research Center submitted a proposal for research to clarify issues relevant to such decisions. The study, FORMATION OF PUBLIC POLICY ON ISSUE OF OUT-OF BASIN DIVERSION OF CONNECTICUT RIVER FLOODWATERS TO BOSTON METROPOLITAN AREA", is being supported under Title II of the Water Resources Research Act and is currently under way. The objectives of this project are twofold: to determine how public policy on this proposed inter-basin water transfer has evolved, and to determine the nature and range of effects that may be produced by diversion of flood waters. Each of these objectives is presented in terms of a set of detailed questions considered to be timely and important:

1. How does public policy evolve in respect to this inter-basin transfer of water? Subordinate questions are:

    a. How did the various interested public groups form their opinions on this controversial issue?

b. How did the attitudes of these public groups change in time and what factors accounted for these changes?

c. How effective were public hearings in providing an opportunity for expression of public opinion?

d. What factors most strongly influenced the attitudes of the members of the special task force assigned by the General Court to the study of the proposed legislation?

2. What consequences in the Connecticut River Basin may reasonably be associated with diversions out-of-the basin? Subordinate questions are:

a. What is the role of flood flows in scouring bottom deposits?

b. What is the role of spring and autumnal flood flows in triggering movements of anadromous fish?

c. What is the role of flood flows in nutrient supply and removal?

d. What is the role of flood flows in the pollution of the river and its amelioration?

e. What is the influence of flood flows on the ecology of tidal and estuarial water?

f. What are the long-term water supply requirements of the basin region?

g. What is the role of Connecticut River flood flows in recharging regional groundwater aquifers important to the region?

Interstate Cooperation

The New England Council of Water Center Directors composed of the six Water Resources Institute Directors has established firm roots and is recognized as an important member of the group of New England Regional Organizations associated with the New England Governors Conference. The Council works closely with the New England River

Basins Commission and, in fact, considers the Chairman of the New England River Basins Commission an ex officio member of the Council. The Council has held three interstate water resources conferences and is completing its plans for a fourth to be held in May, 1971. These conferences were devoted to the following subjects:

November 10, 1966	Conference on Water Rights Law
May 16-17, 1968	Water Resources Planning Conference
November 4-5, 1969	Water Resources Planning Conference -- Effective Consideration of Ecological Factors in Water and Related Land Resources Planning and Management
May 24-25, 1971	Conference on River Diversions

The Proceedings of these conferences are distributed widely.

A new and potentially very important innovation in the Council's program was the recent provision, through an OWRR Title II grant, for a Research Coordinator. A highly qualified individual has been employed in this capacity. His efforts to identify and to recommend appropriate ways of utilizing this full resource for research on water problems in New England promise to be productive and seminal.

A start has been made in the development of cooperative research among the State Universities in New England through the establishment of the University of Massachusetts project, FORMATION OF PUBLIC POLICY ON ISSUE OF OUT-OF-BASIN DIVERSION OF CONNECTICUT RIVER FLOODWATERS TO BOSTON METROPOLITAN AREA (Appendix II, Page 83). The Universities of Connecticut, New Hampshire and Vermont are participating in this research with the University of Massachusetts.

TRAINING

A large number of students in many disciplines have been assisted by direct participation in Center supported research projects. This is apparent in Table III, "Number of Students Engaged in Center-Supported Research Projects". In fiscal year 1970, for example, a total of 94 students participated in these projects. These included 36 candidates for the Bachelor's degree, 34 for the Master's, 23 for the Doctorate and one Post-Doctorate. While it is difficult to estimate the number who on graduation actually went into the water resources fields, it is reasonable to assume that many did so.

TABLE III

NUMBER OF STUDENTS ENGAGED IN CENTER-SUPPORTED RESEARCH PROJECTS

Fiscal Year	Candidates For B.S.	M.S.	Ph.D.	Post-Doctoral	Total
1966	11	8	5	-	24
1967	10	15	5	-	30
1968	15	20	8	-	43
1969	21	37	21	1	80
1970	36	34	23	1	94
1971*	16	32	26	2	76

*Complete as of March 1, 1971. Additional projects to be initiated in Fiscal Year 1971.

Beyond the immediate benefits provided by training through participation in research projects, the Center initiated or co-sponsored a number of projects concerned with the improved preparation of individuals for work in the water resources fields. In the last 5 years, for example, a total of 69 faculty members in 25 disciplines participated in the research program of the Center. Many were, of course, already expert in their water resources specialty before the work was undertaken. However, a number not normally associated with the field of water resources have reoriented their career interest to this area.

A number of short courses were sponsored by the Center or assisted otherwise:

Short Course in "Water Quality Engineering". G. R. Higgins
June 23-27, 1969.

Short Course in "Water Quality Control" -- Activated Sludge
Processes For Industrial Wastes Treatment. L. N. Kuzminski.
March 23-25, 1970.

Short Course on "Joint Wastewater Treatment". E. E. Lindsey.
March 22-24, 1971.

The Center also has supported through funding assistance or through direct participation a number of meetings and conferences whose primary objective was the transfer of information. Examples are:

Municipal Watershed Management Symposium, University of Massachusetts, November 9-10, 1965.

Economic Geology in Massachusetts, University of Massachusetts, January 24-26, 1966.

Symposium on Water Resources Research, University of Massachusetts, June 2, 1967.

Massachusetts Water Resources Commission Meeting, University of Massachusetts, August 6, 1968.

Massachusetts Water Resources Commission Meeting, University of Massachusetts, June 8, 1970.

Third National Symposium on Sanitary Engineering Research -- ASCE Specialty Conference on Disinfection, University of Massachusetts. July 8-10, 1970.

In addition, the following short courses have been organized or are being planned:

Short Course on "Environmental Hydrology". Dr. Ward S. Motts, Department of Geology. Spring, 1972.

Short Course on "Operations Research in Water Resources Planning and Management". Dr. Richard J. Giglio, Department of Industrial Engineering and Operations Research. Summer, 1971.

The Center assisted in the development of a special project on training of high school teachers in the field of water pollution control which was funded by the Federal Water Quality Administration: SUMMER INSTITUTE FOR STUDY OF WATER POLLUTION CONTROL AT THE UNIVERSITY OF MASSACHUSETTS. Principal Investigator -- Dr. Warren Litsky, Department of Environmental Sciences. June 23 - August 1, 1969. The objective of this project was to increase the participants' understanding of water pollution problems, to develop curriculum materials related to water pollution control for high school students, and to evaluate this project in terms of the students' subsequent selection of college programs.

The Center has a keen interest in the development of new courses and strengthening of existing courses in the water resources field. Two new courses have been developed as a result of the Center's activities:

Water Institutions and Policies

Management Science Applications in Environmental Planning

It is now timely that the current offerings of the University in the water resources field be fitted together into an integrated program at the Master's degree level. Accordingly, the Center proposes to advance such a program which will include the following courses:

Ecological Principles of Resource Planning

Management Science Applications in Environmental Planning

Metropolitan and Regional Planning

Resource Economics

Hydrology and Hydraulic Structures

Water Quality Control

Water Institutions and Policies

Water Resources Seminar

The above program should be of particular value for the individuals now working in the water resources fields as specialists who wish to broaden their educational base to prepare themselves for assumption of management functions.

Technology Transfer

The use of short courses, special conferences and formal meetings to convey new knowledge obtained through research is obviously desirable but it may not serve to close completely the persistent gaps between the research worker and the practitioner. Long delays often noted in the rate of transfer of important new knowledge relevant to the water resources fields have been described by many observers. They represent a discouraging -- sometimes the most discouraging -- aspect of the research endeavor. However, while it is simple to lament the existence of these gaps, it is difficult, indeed, to devise practical ways of eliminating them.

Use of demonstration projects can be justified for many types of information transfer, for example, demonstration of a new piece of waste treatment equipment. But such projects do not clearly apply to new knowledge on, say, the subtle ecologic influences of a shift in the interface between fresh waters and marine waters in an estuary, or an understanding of the role of community attitudes in a regional planning effort involving the water resource. Too often useful information gained at considerable expense is lost because it may be too far from the daily work experience of the practitioner. A challenge of this nature currently facing the Center is the application of an advanced planning methodology for regional water pollution control that has emerged from A METHODOLOGY FOR PLANNING OPTIMAL REGIONAL WASTE MANAGEMENT SYSTEMS, B-011-MASS. Principal Investigators -- Dr. D. D. Adrian, Department of Civil Engineering and Drs. R. J. Giglio, F. C. Kaminsky and R. F. Rikkers of the Department of Industrial Engineering. (Appendix II, Page 76).

The Center proposes to enlist the efforts of the University School of Education in finding innovative ways of transferring new and highly technical information to practitioners effectively and expeditiously. It is conceivable that programmed instruction can be adapted to this need so that such important barriers as time away from home and the associated expenses normally required by participation in special courses may be overcome. This appears to be a research area worth evaluating insofar as the water resources field may be concerned. The importance of efficient technology transfer clearly justifies increased experimentation, even adventurous research.

PUBLIC SERVICE

Relevancy to State and regional problems is a key requirement in research projects supported by the Center. For this reason, the Center works closely with the Massachusetts Water Resources Commission and its key operating agencies -- the Division of Water Resources and the Division of Water Pollution Control. The Director participates frequently in the regular meetings of the Massachusetts Water Resources Commission. In addition, the Director serves as a member of the Massachusetts

Public Health Council and is a member of the Advisory Environmental Health Committee. Close personal relationships are maintained with key members of State agencies so as to coordinate work as efficiently as possible. A similarly close relationship is maintained with Federal agencies. The Director assisted the New England River Basins Commission in the development of its Research Committee and participates at regular and special meetings of the NERBC. The Director also served as Moderator of a Citizens Review Committee established by the New England River Basins Commission at the request of Congressman Silvio Conte to review the Connecticut River Basin Comprehensive Water and Related Land Resources Investigation.

The activities of the Director in working closely with State and Federal agencies are paralled by those of many of the principal investigators who by virtue of their research in the water resources field have established themselves as an important University resource to these agencies. The wide spectrum of disciplines represented by principal investigators covers just about every aspect of water resources concern faced by the public agencies in this part of the country.

The staff of the Water Resources Research Center and its associated principal investigators frequently are called on to testify before legislative committees on bills of concern to the development of water resources and related lands. In certain cases, principal investigator have been formally designated to provide legislative assistance. An example is the Director's appointment to the Legislative Oversight Committee on Water Pollution Control.

The Center's responsiveness to the needs of State and Federal agencies is reflected also in the priorities given to research projects, of which the following are the most recent examples:

> EFFECTS OF WATER DIVERSION ON ESTUARINE FAUNA IN MERRIMACK RIVER, MASSACHUSETTS. A-038-MASS. Principal Investigator -- Dr. C. F. Cole, Department of Forestry and Wildlife Management.
>
> This project is directed to an examination of conditions at the salt water-fresh water interface in the Merrimack River estuary. Such information would be useful in an evaluation of proposals for diversion of Merrimack River flood waters to supplement the water supply of Metripolitan Boston.

EVALUATION OF A METHOD FOR CHARACTERIZING THE PONDED WATERS OF MASSACHUSETTS. A-034-MASS. Principal Investigator -- Dr. James A. McCann, Department of Forestry and Wildlife Management.

This project is establishing a methodology utilizing up-to-date information retrieval systems for displaying the character, condition and uses of Massachusetts lakes.

OPTIMIZING STRATEGY FOR STATE WATER POLLUTION CONTROL IN THE POST "PLAN OF IMPLEMENTATION" PERIOD. A-032-MASS. Principal Investigator -- Director Bernard B. Berger, Water Resources Research Center.

This project is directed in part to an examination of new and experimental institutions of water quality management in various parts of the country to determine which may be applied most effectively in Massachusetts.

In spite of the desire to respond to public service requests, the University recognizes the need to exercise some constraint in the discharge of this important function. In the opinion of many concerned individuals, important questions of propriety and procedure remain to be answered. For example, a University response to a community's request for assistance in a pollution control problem may well involve objections on the part of private consulting engineering firms. Another example relates to the Center's research project on diversion of Connecticut River flood waters to Quabbin Reservoir. The objective here is to determine, on the basis of evaluation of existing data, the ecologic consequences of such flood water diversions. The extreme sensitivity associated with this controversial issue was reflected in an initial misunderstanding on the part of officers of the Metropolitan District Commission of Boston.

It is quite clear that while opportunities for responding to requests for public service abound, and many are indeed important, there are questions associated with such assistance that should be carefully examined. For this reason, the Center is supporting the following research project:

OPTIMAL APPLICATION OF UNIVERSITY RESOURCES TO ASSIST PUBLIC AGENCIES ON WATER PROBLEMS. A-030-MASS. Principal Investigator -- Dr. Carl A. Carlozzi, Department of Forestry and Wildlife Management. (Appendix II, Page 61).

This project seeks to identify and analyze the constraints experienced by a State University in responding to public agency requests for assistance in the water resource fields, and to recommend policies and procedures which could constitute a basis for a most desirable State University program of public service in these fields.

The nature and variety of Center supported research projects are reflected in the fact that 16 components of the University of Massachusetts and 25 specialized disciplines have been engaged in this program. In addition, 6 other Colleges and Universities in Massachusetts and 3 Universities in other New England States have engaged in cooperative research with the Water Resources Research Center. A very substantial base for public service, therefore, exists at the University. The value of this resource will depend on the readiness of the public agencies to call on it and, of course, on the willingness of University faculty to respond to such requests. Grounds for optimism exist on both accounts.

APPENDIX I

MAJOR WATER RESOURCES PROBLEMS IN MASSACHUSETTS

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The water resources problems of Massachusetts do not differ essentially from those in other parts of northeastern United States. However, in certain cases factors based on traditional attitudes, perspectives, and practices provide a coloration that make these problems unique.

Five such problems are considered to be of particular interest in terms of future development of this area:

1. Protection and optimum use of lakes.

2. Protection and optimum use of major streams flowing through growing metropolitan areas.

3. Optimum use of tributary watersheds.

4. Protection of estuaries and coastal waters.

5. Protection and optimum use of wetlands and flood plains.

Each of these water resource problem areas presents a complex of important questions. These result from competing social values, lack of scientific data, inadequate techniques for economic analysis, conflicting water rights, and relatively undeveloped planning and management techniques. Because of these uncertainties, public confidence is often absent in the processes by which important decisions are reached in respect to the water and related land resources. These problems areas are discussed below.

1. Protection and Optimum Use of Lakes.

   Massachusetts is blessed by a large number of small lakes which represent a very significant resource in terms of recreation and municipal water supply. In Massachusetts alone there are some 1300 such lakes whose average area is approximately 100 acres. The full potential of these lakes is far from having been realized. However, the trend of regional development points to the need for conserving this water resource and planning for its most intelligent use. To do this, several important studies must be undertaken:

Prepared by: Bernard B. Berger, Director, Water Resources Research Center, University of Massachusetts

A. A system for classifying Massachusetts lakes is essential to the development of a long-range plan for the best use of this water resource. This system should reasonably be based on lake geometry, location, ecology, water quality, and water and adjacent land use trends.

B. The process of eutrophication must be anticipated and prevented or arrested and reversed. The degradation of important lakes has gone quite far in some cases and troublesome growths of algal slimes and other plant weeds are being experienced. Fortunately, advanced eutrophication does not characterize the great bulk of the smaller lakes in Massachusetts. Even so, one may see the handwriting on the wall. Unless checked, the process already going on will continue indefinitely as a result of man's development of adjacent lands. Inevitably the rate of deterioration will increase as the recreational appeal of such bodies of water is exploited. Many of the small lakes have only very small outflow streams, or none at all, and consequently once eutrophied, the lake may remain that way for prolonged periods.

C. The question of multiple use of drinking water impoundments must be reexamined. Historically, municipalities of Massachusetts fortunate enough to have acquired the entire watershed which produces their drinking water have restricted other uses of their impoundments. However, as urban populations continue to grow, the attractiveness of conveniently located impoundments for recreational use will inevitably increase. In addition, where new, supplemented impoundments are proposed, watershed associations and other groups are inclined to protest the elimination of recreational activities that is involved in preemption of a watershed for drinking water use only. Here we are beginning to experience a rather interesting conflict in water rights involving multiple use of drinking water reservoirs. While the justification for restricting the use of such reservoirs is based on public health, there also is a very strong emotional factor that may well be over-riding. This is apparent in such frequently asked questions as: "Why should we let people bathe in our drinking water?, Why should we permit our drinking water reservoir to be used by people who come not from our city alone, but from places hundreds of miles away? and why should we have to pay for the cost of the treatment required?

D. Uncertainties in public versus private rights in respect to these bodies of water should be clarified. It is quite certain that this problem will become increasingly acute. One may phrase this problem in terms of the rights of the members of the public to use the lakes for recreational

purposes as against the rights inherent in riparian ownership or assumed by riparian proprietors. In theory, natural ponds of 10 acres or more in area belong to the public. In practice, accessibility of the public has been increasingly restricted as a result of private development on riparian land.

E. Determinants of lake development now poorly defined should be evaluated. Current confusion is reflected in the following questions: To what extent does development of a lake result in economic benefit to the region? Specifically, how are adjacent land values affected by man's development of the lake resource? How does one determine the relationship between recreational appeal and distance from centers of population? What is the influence of a new highway in increasing the rate of development of a lake resource? How does one protect lake values against the degrading influences associated with an engulfing metropolitan growth?

F. Techniques of lake management should be developed. This is particularly important in respect to organization of riparian owners for lake protection (e.g. policing of use of lake and adjacent land) decisions on lake improvement (e.g. collection and out-of-basin diversion of domestic wastes) allocation of rights among conflicting recreational uses (e.g. speed boating versus fishing and swimming).

2. <u>Protection and Optimum Use of Major Streams Flowing Through Growing Metropolitan Areas</u>.

Urban areas seldom take full advantage of the benefits associated with adjacent major waterways. Only in respect to navigation, hydropower, industrial processing and cooling water, and waste carriage is such natural potential normally exploited. Without adequate safequards the practices usually employed impair the stream's use for public water supply, recreation, fish and game propagation and agriculture.

The pollution of the middle and lower portions of major streams is a problem. A number of deterrents to river cleanup in many areas have been cited:

A. The traditional dependence of large municipalities on publicly-owned and rigidly controlled watersheds for drinking water supply rather than on major streams of the region removes an important force for water quality control. However, this may be less true in the future. As the metropolitan areas of the region increase in population and expand in area, it will become more and more difficult to plan on the use of new such watersheds. Recent attempts to do so have been met with resistance that hitherto had not been experienced. It is timely therefore that the following questions be answered: To what extent will the drinking water supplies of future urban populations depend on use of the main stem of the Connecticut River and other streams of the State?

When will such use become necessary? What will be the influence of such planned water use on stream classifications and on programs for control of municipal and industrial wastes and land drainage?

B. Serious economic barriers to industrial waste control have been reported. In Massachusetts, as elsewhere, many industries claim that the cost of controlling waste is prohibitive, and that stringent requirements may place them at a competitive disadvantage or force them out of business. It is almost impossible for the public official to evaluate such claims. This problem, often experienced, probably will become acute when attempts are made to raise the quality classification of streams. It is important therefore that the following questions be examined: What should be the public policy in the face of this claim by industry? What experience and devices are available to the regulatory agency? To what extent should this agency be expected to examine the equities of the case? What methodology is available in doing this?

C. Storm water and overflows from combined sewers are significant, unsolved pollution problems. Until effective control procedures are developed, it may not be possible for streams to meet desirable water quality criteria for use in recreation and as sources of drinking water.

D. The actual potential of recreational use of the river is uncertain. Proponents of recreational development of major streams base their claims on assumed projected needs of the population concerned. In certain cases these claims have been opposed. For example, it has been said that the public would prefer swimming pools to the stream, and that the construction of such swimming pools would be much less expensive than the development of a stream for this use. A study is needed of the attitudes and actual interests of the population in recreational use of major streams. In this connection, answers should be sought to the following questions: What recreational uses are involved? Who actually would use these benefits? What alternatives are available to satisfy this need?

E. There is uncertainty in respect to the economic benefits that may be realized as a result of rigorous water quality management. A question asked more and more frequently is: How much would it cost municipalities and industry to raise a given stretch of river from a stream classification of C to one of B? What economic benefits can be associated with this improvement of water quality? Who would realize these benefits? What should be the public policy with regard to protection of the public interest in these benefits? It is reasonable to believe that the improvement of a major stream

to permit new and expanded uses would produce economic benefits of many kinds. Proponents of stream cleanup need quantitive information concerning such benefits. The existing methodology for obtaining such data is not dependable.

F. Many areas are apparently reluctant to use a regional approach to water quality management. With the increasing stress on the river basin-wide approach to water resources planning, it is important that retarding influences be identified and examined. A good starting point would be those areas that have failed to develop a truly effective regional approach to water quality management in spite of many inducements to do so. Associated with this reluctance to join together for the advantage of all, is the persistence of unresolved conflicts concerning water rights on the part of neighboring or nearby municipalities. There appear to be factors strongly-rooted in traditionalism and in other obscure aspects of municipal behavior that account for it. Good opportunities exist for solving this problem through research on the kinds of attitudes one encounters among decision-makers in such areas, and the underlying and perhaps unconscious influences that account for such attitudes. The understanding so gained could be used in plan development and its presentation.

G. Conventional methodology for planning a regional waste disposal system is relatively inefficient. The technology of optimizing such a system in terms of lowest overall cost can be improved. Planning, design and operational problems associated with large and growing urban areas require approaches based on analysis of multiple, interrelated and very complex conditions. Included in such technology are utilization of advanced waste treatment processes, stream storage for flow regulation, and waste storage for phased discharges. An improved technology of regional waste disposal requires accurate projections of population growth and its distribution, and projections of industrial development and its distribution within the metropolitan area.

H. Intermittent reductions of normal stream flows resulting from operation of hydropower systems reduce the stream's ability to assimilate wastes and in addition, may produce serious ecologic impairments. A policy should be established requiring minimum releases from power dams as a condition for FPC permit renewal. Further, equitable measures should be developed for placing this requirement on all other hydropower systems. To do this reasonably, studies should be undertaken to determine realistic levels of minimum flow releases and, where necessary, the equities involved.

I. Proposals for trans-watershed or out-of-basin diversions of water will continue to arouse fear among basin residents. It is important that satisfactory procedures be established for making decisions on such proposals. Such procedures should recognize the possibility of occurence of ecologic damage and should provide acceptable safeguards against this hazard.

3. Optimum Use of Tributary Watersheds.

Decisions on ways in which water resources are developed in the relatively small tributary watersheds of Massachusetts currently are made by the people and agencies of the watershed concerned. The State exercises reasonable control on such decisions, and only in exceptional cases does it superimpose its decisions on water uses over those made internally. By and large, the rights to the water produced in a watershed belong to the riparian communities and other riparian interests located in that watershed. However, it is clear that externally-generated demands will place more and more stress on these waters. These demands originate in the expansion of the population in metropolitan areas of the State and the associated need for water, the growth of industry, and the ever increasing appeal of recreational use of such waters.

It is foreseen that competition for such waters will become keener and more complex. Pressure inevitably will be placed on the tributary watershed to fit into broad resource plans so that important regional water use requirements may be satisfied. It is becoming increasingly important therefore to evaluate the needs and the rights of competitive water users, including major users who claim interbasin water transfer rights; to determine the validity of estimates of water needs by municipalities, industry and agriculture; to determine the relationship between water resource development and the associated economic return to the watershed; to evolve institutional arrangements appropriate to watershed management of water quality and quantity; and to understand attitudes of decision makers in respect to acceptance of rational long-range plans for water use.

A. An evaluation is required of needs of competitive water users. Competition for a given water resource will certainly increase. Each of the urban areas must look to new sources of water to satisfy its future demands. In a sense, each such urban area exerts a gravitational force which places a stress on a given watershed and influences the development of a water use plan. Moreover, not only will the extra-watershed urban areas compete with each other, they will compete with intra-watershed, community water supplies, industry, recreational interests, and agriculture. The research question is: How do the planners evaluate the various water demands and make rational decisions based on overall public good?

B. The validity of estimates of water need by municipalities, industry and agriculture must be examined. It is clear that under the stress of the recent water shortage, economies in water use have been effected without sacrificing essential requirements. It seems irrational to permit wastage of water even where supplies are temporarily abundant. The long-range plan must assume that such wastage will have been eliminated. The questions that remain for the planner are: What assumptions on unit water allowances may reasonably be permitted in the plan for the various competing water users? How can pricing policy be best utilized to reduce water demand?

C. The relationship of water resource development to economic benefit of the watershed should be studied. The large number of alternatives that must be considered in determining desirable combinations of future water uses makes this an interesting problem in economics and planning. In addition, it certainly seems reasonable to assume that the degree to which land values will be enhanced will influence the nature of long-range plan. In this connection, it is realized, of course, that land values may be depressed with certain uses of the water resource. For example, approval of the use of the water resource to receive poorly treated liquid waste from industry will certainly have an adverse effect on adjacent land value. On the other hand, the use of the water resource for recreational purposes may be of great benefit to a few and to the economic disadvantage of others. Research on economic projections as related to water resource development is important.

D. Means must be evolved for obtaining an effective watershed-wide administration of the water resource. The problem of multiple political entities within the watershed is recognized as a major factor in planning the water resource development. The research question applies to the nature of the new administrative institution that is most compatible with the traditions and needs of the area.

E. An optimum long-range plan must take into account the attitudes of decision-makers in respect to their willingness to accept the plan. Any such plan would remain simply an exercise in the techniques of planning if it did not have the support of the people who have to make the plan operative. The research question is: How can significant attitudes be objectively characterized, evaluated, and incorporated into the planning operation?

F. Disputes on water rights undoubtedly will become more acute when the planning agency attempts to make decisions on allocations among water users. Conflicts are already present

in many areas because of the many acts of legislation dating back to the early days of the Commonwealth, and before. Clarification of existing rights and identification of legislative needs in respect to water law are essential to sound water resource planning.

4. Protection of Estuaries and Coastal Waters.

The estuaries and coastal waters of Massachusetts represent a resource whose full values have yet to be exploited -- or even recognized. Such values would certainly include recreational uses, biological productivity, and aesthetic enjoyment. These values are vulnerable to pollution from the sea as well as the land. A basic need exists to evolve systems for prudent planning of coastal land use. Long-range plans must be developed for rehabilitation of degraded areas and preservation of beaches. The problems of pollution are particularly urgent.

The major estuaries of Massachusetts, like those elsewhere, are depositories of pollutional materials contained in tributary streams, in inadequately treated wastes, and in the generalized drainage from land areas bordering on the estuaries. Most estuaries contain a heritage of pollution in the form of bottom deposits of slowly decomposing organic sludges. These materials exert a constant pollutional effect on the overlying waters and at the same time they reduce or destroy the value of important shellfish areas and other fisheries. From time to time, strong arguments are presented for the cleanup of these water resources. Often, these arguments are met with counter arguments to the effect that a high level of water quality should not be expected or be required in estuaries. It has been stated that the economic value of shellfish beds and other fisheries resources within the estuary does not justify the utilization of a high level of waste treatment. While it is recognized that natural bathing areas must be protected for reasons of public health, and that gross pollution must be prevented to preserve aesthetic appearance, it is believed by some that the economic justification for treatment beyond these requirements does not exist. Among the important research challenges are those reflected in the following questions:

A. How may patterns of urban population, industrial, and recreational development be projected in terms of their influence on estuarial water quality and on water quality criteria?

B. How may techniques for estuarial study be improved in terms of reliability of data and lowered costs of survey procedure?

C. How may procedures for determining the value of the water uses to be protected be estimated with confidence and how should they be weighed against the costs of attaining the desired water quality objectives?

D. What pollutional effects are exerted by bottom deposits in estuaries? How may such deposits be eliminated or controlled most effectively?

5. Protection and Optimum Use of Wetlands and Flood Plains.

Massachusetts has experienced strong contention with respect to the need for preservation of wetlands. On the one hand are land developers who claim that drainage of wetlands is essential to a desirable regional land use plan. On the other hand are those who are concerned that elimination of wetlands may have far reaching effects on the ecology of the region, the maintenance of groundwater supplies, and the control of floods. Massachusetts is the only state which has legislated restrictions on the use of inland wetlands. The pioneer "Hatch Act" requires a permit to alter freshwater wetlands which border streams and waterbodies but restricts alteration only in cases where public water supplies are endangered and where flood control is impaired. Wildlife, groundwater, aesthetic and other values are not recognized. The "Inland Wetlands Act", which does provide restrictions which recognize a broad array of values, has taken a year and one half to be implemented. The delay has been largely due to an inability to delineate wetlands accurately on a map scale acceptable to assessors and registers of deeds. The development of practicable techniques for delineating the boundaries of wooded and open wetlands on assessors' maps would be an important step in wetlands protection. Implementation and acceptance of restrictions on coastal wetlands has progressed further than on inland wetlands because the values of coastal wetlands to the affected communities are more obvious to the public.

A special problem is the use of wetlands, including coastal wetlands, as sites for refuse disposal with consequent pollution of coastal and groundwaters. Such practices should, of course, be discontinued or used only with very stringent controls. In evaluation of low lands for use as sanitary landfill sites, the need exists for dependable methods of predicting the effect of leachings on groundwater and for means of protecting groundwater from such leachings.

It is generally agreed that use of the floodplain should be an essential component of comprehensive flood control programs. Some say that prudent use of floodplains would significantly reduce the need to depend on structural methods for containing flood waters. Further, they say that failure to reserve use of floodplains for this purpose may lead to heavy capital investments in alternative land developments which are then used as justification for additional flood control structures -- an open-ended, highly costly process. Detailed hydrologic studies of the role of wetlands in moderating flood are needed.

There is a growing need for a rational system of land use planning that will identify land areas whose primary use should be for flood control. This system would make possible an analysis of benefits and costs including the costs of ecologic impairment

such that a balanced system of floodplain use and structures could be evolved. An important part of flood management systems would be the employment of effective controls on floodplain acquisition and use.

Massachusetts shares other problems with the rest of the nation in addition to those outlined in this paper. Most important are the problems associated with public and industrial water supplies, propagation of fish and wildlife, use and reuse of water by industry and agriculture, groundwater intelligence, recreation, and water resource development for navigation. A particularly significant need is emerging for practicable techniques that will permit confident predictions of the probable ecologic consequences of proposed water resource developments.

APPENDIX II

ABSTRACTS OF ALLOTMENT GRANT, MATCHING GRANT AND TITLE II PROJECTS

Allotment Grant Projects

A-001. A SURVEY AND EVALUATION OF SMALL ARTIFICIAL RECREATIONAL PONDS IN CENTRAL MASSACHUSETTS. Principal Investigator -- Dr. James A. McCann, Department of Forestry and Wildlife Management. Project Initiated June, 1965.

Objective:

To determine whether small artificial ponds designed primarily for watering livestock and fire fighting might also be used for recreational purposes, including fishing and swimming.

Accomplishments:

Information was obtained on the changing chemical, physical, and biological characteristics of such bodies of water and on the nature and quality of pond maintenance practice. The study showed that few of these small artificial ponds could serve as desirable recreational facilities because of progressive deterioration. This was evidenced by eutrophication; deficiency in dissolved oxygen; lack of care; increase in bottom deposits; and leakage of water. The conflict of utilitarian with recreational use has demonstrated that the pond owner may expect to realize no appreciable recreational value without investment of funds for proper construction of ponds and special effort in pond management. The project has elicited a strong interest on the part of State agencies and farm groups in Massachusetts who see sense and profit in multiple use of small artificial bodies of water. The guidelines and recommendations contained in the final report should have significant effect on planning by several State organizations.

Status:

Completed June, 1968.

A-002. (Revised to A-019A) THE ECOLOGY OF THE YOUNG FISHES OF THE WEWEANTIC RIVER ESTUARY. Principal Investigator -- Dr. C. F. Cole, Department of Forestry and Wildlife Management. Project Initiated July, 1965.

A-002. (Revised to A-019A)

Objective:

To define the influence of environment on an important fishery in a pollution-free area.

Accomplishments:

In the early stage of this study, it was found that the very important winter flounder fishery in Buzzards Bay was deteriorating. It was postulated that the causative conditions stemmed from naturally occurring physical changes including movement of sands in estuaries where spawning normally occurred. In line with this assumption, the project examined a number of environmental variables including temperature, salinity, bottom sediment patterns, and engineering construction. Pollution was initially not considered to be a factor in these estuaries because of the low density of population and the absence of industry. However, the presence of pesticide in fish larvae disclosed the possible significance of this factor. Vulnerability of important fish species to pesticides in very low concentration would not be surprising. Further, this vulnerability need not necessarily be reflected in spectacular fish kills. Rather the effect could be insidious, and be manifested in poor efficiency of egg hatching with gradual reduction and ultimate disappearance of the fish of interest. In this case, we would experience an impairment in fish similar to that widely reported in connection with the hatching of eggs of birds. The results emphasize the need for extraordinary care in the application of pesticide wherever land drainage may reach waters that are important to valuable fish.

Status:

Completed June , 1969.

A-003. HYDROLOGICAL STUDIES IN MASSACHUSETTS. Principal Investigator -- Professor George R. Higgins, Department of Civil Engineering. Project Initiated June, 1965.

A-003. Objective:

To relate the flow in Massachusetts streams to precipitation, evaporation loss, and other meteorological factors, including protracted drought.

Accomplishments:

The need for up-to-date information and estimates on water yield was made apparent during the 1962-1966 drought in this part of the country. It had been found that conventional assumptions on runoff were inadequate. For this reason, the reports entitled "Yield of Streams in Massachusetts" and "Hydrological Studies in Massachusetts" issued by the Water Resources Research Center are now being widely used by State, Federal, and local agencies and their consulting engineers in Massachusetts. There appears to be little question that these publications have responded to an important need.

Status:

Completed June, 1968.

A-004. PILOT STUDY OF THE OCCURRENCE AND CHARACTERISTICS OF SHALLOW AQUIFER CONTAMINATION IN MASSACHUSETTS. Principal Investigator -- Dr. Ward S. Motts, Department of Geology. Project Initiated September, 1965.

Objective:

To determine variations in quality of groundwater with respect to geology and in terms of geomorphic location of wells, well fields, and springs.

Accomplishments:

Analyses of groundwater quality data indicate four major hydrochemical facies in the State of Massachusetts: (1) an acidic facies that covers most of the State; (2) an alkaline facies in Western Massachusetts; (3) an alkaline facies in the Connecticut Valley; and (4) an alkaline facies in Northeastern Massachusetts. Most groundwater

A-004. Accomplishments, Cont.

in Massachusetts has been classified as the acidic hydrochemical facies where the rock material is predominately non-calcareous. The groundwater in this category is characterized by low pH, generally low hardness and alkalinity, and often high iron and manganese.

The alkaline (high pH) hydrochemical facies of the Connecticut Valley is not well understood. Many analyses are characterized by relatively high pH without accompanying high hardness and alkalinity. In other cases high hardness accompanied by low alkalinity and chlorides is believed to be due to sulphates.

The alkaline hydrochemical facies of northeastern Massachusetts may be due to weathering and solution of the Salem gabbrodiorite and associated rocks which outcrop extensively in that area. Calcium feldspar decomposes, in part, to calcium carbonate -- the solution of which results in high pH, alkalinity and hardness.

Two hundred chemical analyses of groundwater were classified as to geomorphic location of the well, well field, or spring from which the sample was obtained. The preliminary data available indicate that highest concentrations of iron and manganese occur near the groundwater discharge areas (floodplains and near lakes); whereas the lowest concentrations of iron and manganese occur in the recharge areas (on flats). Chemical analyses indicate small but steadily increasing mineralization of Massachusetts groundwater particularly in chlorides and iron. The mineralization of Massachusetts groundwater could result from many factors including addition of salts to highways, increase of town dumps, build-up of general organic pollution from housing and septic tanks, and other causes. Groundwater supplies in large areas of the State could be in future danger if mineralization continues to increase at the present rate.

Status:

Completed June, 1967.

A-005. DEVELOPMENT OF METHODS FOR INCREASING EFFICIENCY OF WATER USE IN CRANBERRY CULTURE. Principal Investigator -- Professor John S. Norton, Department of Agricultural Engineering. Project Initiated July, 1965.

Objective:

To devise a reliable, inexpensive system of temporary dikes for use in cranberry bogs that would assure maximum utility of flood waters with minimum water wastage.

Two major factors affect the efficiency of water use in bog flooding practices: the inability to return the flood water to the reservoir after it has served its purpose, and the excessive amounts of water that must be used. This latter is aggravated by the fact that many bogs, especially the larger ones, are seriously out of grade.

Accomplishments:

The research task was to reduce the quantities of water required for efficient cranberry growth in Cape Cod cranberry bogs, and to maximize the reuse of the limited waters available. The problem was compounded by the fact that a permanent diking system is expensive and removes from use approximately 5 - 10 percent of the valuable bog area, a serious deterrent to any attempt to conserve water by dividing large, unevenly graded bogs to smaller, evenly graded ones.

A number of materials were tested for utility in the construction of temporary dikes, including two thicknesses of sheet vinyl, 13-mil and 20-mil, twenty-mil thickness sheet aluminum and 12-inch diameter, neoprene coated nylon tubing. The sheeting materials were used to form fixed location dikes while the tubing was used for portable dikes. Detailed investigations were conducted on structural characteristics of the various diking systems. These investigations covered seepage and washout occurrences, nature of desirable dike anchorage under several field conditions, soil and grade factors, and protection against muskrat damage. Cost and reliability relationships were determined. It was concluded tentatively that the positive reliability associated with the narrow earthen dike with aluminum core probably outweighed less expensive diking systems utilizing vinyl sheeting, simple aluminum barriers and nylon tubing.

A-005. Status:

Terminated June, 1967 on the basis that further testing of the dikes would be conducted as a part of the normal operation of the University of Massachusetts Cranberry Experiment Station bog over the next several years.

A-006. RELATION OF SEDIMENT LOAD TO HYDROLOGICAL CHARACTERISTICS OF CONNECTICUT RIVER BETWEEN NORTHFIELD AND SPRINGFIELD, MASSACHUSETTS. Principal Investigator -- Professor Miles O. Hayes, Department of Geology. Project Initiated June, 1965.

Objective:

To determine the relationship between characteristics of river flow and sediment load in the Connecticut River between Northfield and Springfield, Massachusetts.

Accomplishments:

In general, in that portion of the River between the Turners Falls dam and the Holyoke dam, as depth increases, velocity decreases. Theoretically, stream velocity should increase downstream, but the trend is a general upstream increase in current velocity. This is probably the result of the fact that the upper end of the zone under study is a natural channel being fed from the Turners Falls dam, whereas the lower end is usually partially ponded by the dam at Holyoke. Thus, the dams assume a critical role in the overall problem of correlating hydrology with sediment load. In areas where the channel bottom is composed of bed rock, the velocities tend to be greater because the channel is more constricted. Analysis of the sediment from this reach of the River shows basically two sediment types: gravel in the northern section and sand in the southern portion.

Analysis of samples collected from the tributaries of the River do not indicate any trends in the mineralogical data. General trends in textural parameters are clear however, as most of the tributaries (and much of the main channel itself) in New Hampshire and Vermont are floored with coarse gravel and boulder deposits, whereas most of the streams south of Amherst, Massachusetts transport primarily sandy or muddy sediments.

A-006. Accomplishments, Cont.

The following additional studies would be desirable: (1) Determination of the effects of dams on the hydrology and sedimentation of the Connecticut River; (2) seasonal studies on the relationship of fluvial processes with sediment transport, including the amount of sediment in suspension, migration of point bars and changes in river channel configuration; (3) improvement of techniques for sampling suspended sediments.

Status:

Completed June, 1966.

A-007. THE ECOLOGICAL SIGNIFICANCE OF CELLULOLYTIC BACTERIA IN QUABBIN RESERVOIR. Principal Investigator -- Dr. J. T. Reynolds, Department of Biology, Clark University. Project Initiated June, 1965.

Objective:

To provide information on the ecological significance of cellulolytic bacteria in Quabbin Reservoir.

Accomplishments:

The results of this research indicated that the cellulose-dependent bacteria in a clean body of water utilize algae as a major carbon source. The decomposition of algal materials sustains the bacterial population. This observation is noteworthy because it suggested the possibility that by manipulation of bacterial species it might be possible to interfere with the normal process of recycling of nutrient salts released on algal decomposition such that these nutriends are effectively diverted. Manipulation of microbial communities on a macro-scale has hitherto not been tried, although in the laboratory there has been considerable work in this general area.

Status:

Terminated June, 1967 (to be supported under Project B-006).

A-008. (Revised to A-019B) ADSORPTION OF PESTICIDES ON EARTH MATERIALS. Principal Investigator -- Dr. John H. Baker, Department of Plant and Soil Sciences. Project Initiated July, 1965.

Objective:

To determine (a) the degree to which a representative organic phosphorous pesticide (Atrazine) is adsorbed by various soils, and (b) the influence of environmental factors on the adsorption and desorption processes.

Accomplishments:

Study was directed specifically to the influence of soil moisture on the desorption process, and an equation was derived which described this relation. The equation appears to be applicable not only to soils but, and more important from the water resources point of view, to bottom deposits and suspended sediments in bodies of water. Given information on the nature of eroded soils reaching the water body and the concentration of adsorbed pesticide, the equation provides a basis for estimating the level of pollution that would result from desorption from suspended sediment and bottom deposits.

Status:

Completed June, 1968.

A-009. CLOSED SYSTEMS FOR ANIMAL SEWAGE TREATMENT. Principal Investigator -- Dr. J. T. Clayton, Department of Agricultural Engineering. Project Initiated July, 1965.

Objectives:

(1) To develop a waste stabilization system that will minimize the polluting strength of manure and other dairy farm wastes.
(2) To clarify, by digestion and subsequent treatment, the liquid (or liquifiable) parts of dairy farm wastes so that the system effluent can be used as the agent for subsequent cleanings of the dairy facility.

A-009. Objectives, Cont.

(3) To study the methods and effects of subsurface distribution of treatment system effluent. (a) To investigate the flow parameters of subsurface sewage effluent disposal; (b) to investigate the chemical and structural changes in the soil due to the subsurface addition of sewage effluents; (c) to study the ecological changes, if any, resulting from the addition of liquid wastes in o subsurface disposal field; (d) to investigate the movement of enteric organisms through the soil and their survival time in the soil; and (e) to develop equipment and procedures for dependable subsurface placement of sewage effluents.

Accomplishments:

The research has demonstrated that a simplified version of the activated sludge process (a process which has been used very successfully in the treatment of municipal wastes) can be used to reduce the strength of dairy farm wastes by 95 per cent or more, especially when used in conjunction with a pre-treatment mechanical separation process in which the stable components of the manure are removed. Furthermore, the processing system produces a stabilized residue that is low in pollution potential and which can be disposed of at times when the likelihood of runoff and stream pollution is small.

Although the strength of the liquid effluent from the treatment system is usually less than 5 per cent of that of the original waste, it is still higher than that of domestic sewage. Additional treatment is, therefore, required. In work presently underway, an effort is being made to further treat the effluent by injecting the liquid into a subsurface soil disposal field by means of specially developed nozzles. Current work is showing that nearly all of the standard criteria for evaluation of treatment system performance show that agricultural soils, even in depths as little as 18 inches, can serve

A-009. Accomplishments, Cont.

very effectively as tertiary treatment components. A long-range aim is to obtain an improved understanding of the potential of soil to treat such effluents so that reliable systems may be designed.

Status:

Completion Date June, 1971.

A-010. (Revised to A-019C) PESTICIDE OCCURRENCE, CONCENTRATION AND DEGRADATION IN FREE WATER SYSTEMS. Principal Investigators -- Dr. C. W. Miller and Dr. B. M. Zuckerman of the Cranberry Experiment Station and Dr. H. B. Gunner, Department of Environmental Sciences. Project Initiated July, 1965.

Objective:

To determine how a representative phosphorous pesticide (Diazinon) is biologically degraded in water systems.

Accomplishments:

Diazinon was broken down by a synergistic action of two microbes, Arthrobacter and Streptomyces species, neither of which could do the job alone. The project provides a basis for the claim that biodegradation studies employing pure cultures of microorganisms or studies limited to individual species could provide misleading or erroneous results. The results demonstrate that the breakdown of organics is a complex phenomenon. It is, therefore, conceivable that environmental change that would influence the efficiency of a key individual species of microorganism in a large community of microorganisms could seriously interfere with the degradation process, even though the microorganism was only remotely connectad with this

A-010. (Revised to A-019C)

Accomplishments, Cont.

process. This project has also produced new knowledge on the biological pathways by which the organic phosphorous compound parathion is broken down by plant systems including algae. An interesting finding was that contaminating microbiota could exert an important influence on biodegradation by algae and higher plant systems.

Status:

Completed June, 1968.

A-011. EFFECTS OF ORGANIC DEPOSITS ON WATER QUALITY IN IMPOUNDMENTS. Principal Investigator -- Dr. T. H. Feng, Department of Civil Engineering. Project Initiated July, 1965.

Objective:

To determine the significance of lake bottom deposits in increasing lake eutrophication, and to identify the environmental conditions that affect this process.

Accomplishments:

This research provided information on stabilization phenomena involved in degradation of benthic deposits of lakes. The finding that the major part of the decomposition process and the associated release of phosphates to the overlying water occurs during the first few months following deposition points to the need to apply effective controls early in the life of such deposits.

Status:

Terminated June, 1968 (to be supported under Project B-005).

A-012. THERMODYNAMIC RELATIONSHIPS WITHIN THE SYSTEM "SEDIMENT-WATER-AIR". Principal Investigator -- Dr. O. T. Zajicek, Department of Chemistry. Project Initiated September, 1965.

Objective:

To determine the importance of iron oxides reaching the oceans in land drainage in maintaining a constant atmospheric oxygen concentration by producing a chemical equilibrium at the ocean-atmosphere interface.

Accomplishments:

The initial experiments were designed to be exploratory so as to help define the problem areas and aid in the design of subsequent work. Conductivity and pH measurements were carried out on solutions of iron (III) nitrate in chloride-nitrate media. The pH range, electrolyte concentration and composition were varied. This initial phase of the work was designed to test for the presence (or absence) of specific ion effects. While the results are indefinite in many respects, they do suggest that chloride plays a role in the hydrolytic nature of Fe (III). Much more interesting work remains to be done on these systems. Further investigation of the nature of the polymeric species observed should be carried out; this would give us a better insight into the nature of solid surface-solution interactions. The main question of O_2 buffering is still unresolved and, while not urgent, should be continued. The findings of such research will bear on the problems of acid mine drainage and iron bacteria, as well as the oxygen question.

Status:

Completed June, 1967.

A-013. THE EFFECTS OF CLIMATE UPON THE WORK CAPACITY AND CARDIAC AND OPERCULAR CYCLES IN FRESH-WATER FISH. Principal Investigator -- Dr. John L. Roberts, Department of Zoology. Project Initiated July, 1965.

Objective:

To determine the effects of climate upon the work capacity and cardiac and opercular cycles in fresh-water fish.

A-013. Accomplishments:

The effects of sustained swimming on heart and ventilation rates of three species of fresh-water fish were examined. Cardioacceleration was evident in all three species. An increase in ventilation rate was also evident in the three species. As soon as swimming commenced, ventilation frequencies increased rapidly, but then fell to stabilized levels which were found to relate directly to swimming velocity. Unlike cardioacceleration (maximum 1.5 to 2X resting), increases in rates of gill ventilation in these fishes bears a direct proportionality to swimming velocity for sustained swimming (maximum 2 to 3X resting). Measurements of buccal and opercular pressures in trout held in a stream of flowing water, but not swimming, indicate that their pattern of ventilation does not change appreciably with changes in water velocity past the head.

Status:

Completed September, 1966

A-014. CONFERENCE ON APPLIED GEOLOGY IN MASSACHUSETTS. Principal Investigator -- Dr. O. C. Farquhar, Department of Geology. Project Initiated July, 1965.

Objective:

To determine the status of knowledge concerning the geology of Massachusetts and the water resource.

Accomplishments:

A three-day conference on Applied Geology in Massachusetts was held at the University of Massachusetts in January, 1966. Specific topics dealing with water resources in Massachusetts included: (1) seismic surveys for ground water investigations; (2) a water resources planning study; (3) the U.S. Geological Survey ground water program; (4) ground water in the Connecticut Valley; (5) the use of geology in the development of ground water supplies; (6) surface water; (7) rock chemistry in water quality control. Several other contributions dealt with water resources in Massachusetts in the context of applied aspects of engineering geology, such as papers on damsites, tunnels, foundations, erosion control, mineral processing, land reclamation, and property valuation. A Conference Proceedings was published.

Status:

Completed June, 1966.

A-015. SUB-SURFACE IRRIGATION OF TURF AREAS -- NOZZLE DESIGN AND SPACING. Principal Investigator -- Dr. L. F. Whitney, Department of Agricultural Engineering. Project Initiated July, 1965.

Objective:

To develop an efficient system of sub-surface irrigation of crop land and turf areas by (1) designing a nozzle with non-clogging orifices for various flow rates and (2) determining desirable spacing of orifices.

Accomplishments:

This research has produced a plastic tubing which, because of a special kind of perforation, may find widespread use in the sub-surface application of liquids. The perforation formed by use of an extrusion process is critical to the usefulness of the pipe. All common methods of perforating the pipe were found to be ineffective in application of sub-surface waters under pressure because of fouling or plugging. The utility of this plastic distribution pipe is now being evaluated in respect to stabilized, settled dairy farm liquid waste.

Status:

Terminated June, 1967. (Project merged with A-009).

A-016. SMALL WATERSHED STORAGE INCREASE USING LOW DAMS. Principal Investigator -- Professor K. N. Hendrickson, Department of Civil Engineering. Project Initiated August, 1965.

Objective:

To determine the feasibility of increasing the base flow from small watersheds by building low dams at places where their construction will retard the run-off from short duration rainfall, increase infiltration, and hence, groundwater reservoir capacity.

Accomplishments:

A simple, rational method of appraising, designing and estimating the value of the low dams was evolved which should be usable for

A-016. Accomplishments, Cont.

superintendents of water departments and small city engineering firms who have town and city water departments as clients. The scheme consists of estimating base flow, infiltration capacity and evaporation from a short summer rainfall by observing the amount and duration of the rain, the runoff of the stream and the change of the water table. From this data, the probable change as the result of construction of a low dam is estimated. The change is related to the domestic price of water and its probable value to the system to determine if the project is economical. A case study was used to illustrate the method.

Status:

Completed October, 1966.

A-017. THE MECHANICS OF FLUID TRANSPORT IN VEGETATION. Principal Investigator -- Professor Denton B. Harris, Department of Civil Engineering. Project Initiated July, 1965.

Objective:

To determine the mechanics of fluid transport in Vegetation.

Accomplishments:

The cohesion theory of sap flow in vascular plants was tested. Measurements of flow as a function of pressure drop indicated that excessive negative pressures would be required for correlation between expiration rates and permeability in several species native to New England. Attempts to duplicate measurements on diurnal variations in transpiring trees, as reported by other investigators, failed. Careful calibration indicates that the measuring apparatus undergoes greater dilation due to thermal change than does vegetation due to expiration. Subsequent to proper calibration it was found that no measurable variations (to 1 part in 10,000) occur. In a study of the correlation between mass flow in vegetation and electric field potential, it was shown that high intensity electric fields do have an effect on expiration rates in tomato plants. It was also demonstrated that pressure induced flow in vascular plants produces an electric potential gradient.

A-017. Accomplishments, Cont.

These results indicate that atmospheric potential and/or biochemical potentials within the plant may, in part, account for the driving forces for sap flow in vegetation.

It is recommended that further research be constructed as follows: (1) micro-electrometric surveys of living plant tissue, and (2) gravimetric studies of expiration in electric fields at field intensities of between 200 and 500 volts per meter.

Status:

Terminated June, 1967.

A-018C. DETERMINATION OF THE FEASIBILITY OF REMOVAL OF ALGAL NUTRIENTS IN LAKE WATERS BY ION EXCHANGE. Principal Investigator -- Dr. O. T. Zajicek, Department of Chemistry. Project Initiated July, 1967.

Objective:

To evolve a method of removing phosphates present in eutrophied lake waters by an ion-exchange system.

Accomplishments:

The results have been favorable. It has been found that properly selected ion-exchange material becomes more rather than less efficient as the concentration of phosphate ion is reduced. This is a distinct advantage. Further, it has been found that this ion-exchange material works well in lake waters having chemical characteristics reflecting conditions that prevail in most of our lakes. For example, the kinetics of the exchange process are rapid and most efficient in neutral waters, which are common in Northeast United States. Since feasibility has been affirmed in the laboratory, it is now appropriate that a field scale experiment be designed. If this is successful, its application would be

A-018C. Accomplishments, Cont.

one of the measures that could be taken to reverse the process of eutrophication. It would supplement such other methods as nutrient removal from waste effluents discharged into the lake, diversion of nutrient-laden waste effluents, removal of phosphate rich bottom deposits, and removal of aquatic weeks.

Status:

Completed June, 1970.

A-018D. (A-023) THE ROLE OF AQUATIC VASCULAR PLANTS IN THE EUTROPHICATION OF SELECTED LAKES IN WESTERN MASSACHUSETTS. Principal Investigator -- Dr. R. B. Livingston, Department of Botany. Project Initiated August, 1967.

Objective:

To determine if lake eutrophication may be reduced by trapping nutrients in aquatic vascular plants which may be harvested and removed.

Accomplishments:

The growth and distribution of the aquatic vascular plants in nine lakes in western Massachusetts were examined in the field for two growing seasons. The specific objective of the study was to relate the growth and distribution of the vegetation to the concentrations of nitrogen and phosphorus in lake water and plant tissues, and to environmental conditions as determined by measurement of pH, total alkalinity, Secchi transparency, temperature, dissolved oxygen and conductivity. No significant correlations were obtained in these analyses. Therefore, it cannot yet be said, at least on the basis of the results obtained in this study, that some aquatic vascular plants are particularly effective in trapping nutrient chemicals in their living tissue. Harvesting of aquatic vascular plants and subsequent removal from the watershed does not appear to be an effective way of arresting and reversing the eutrophication process.

Status:

Completed June, 1970.

A-019A. See A-002.

A-019B. See A-008.

A-019C. See A-010.

A-020. MICROBIAL DEGRADATION OF ORGANIC POLLUTANTS OF INDUSTRIAL ORIGIN. Principal Investigator -- Dr. H. B. Gunner, Department of Environmental Sciences. Project Initiated July, 1967.

Objective:

To determine practical ways of manipulating communities of microorganisms for the purpose of biodegrading organic compounds of industrial origin that normally are highly resistant to such processes.

Accomplishments:

The organophosphate insecticide Diazinon was selected as the best compound in view of the growing displacement of the chlorinated hydrocarbons by members of this class of compounds. The project turned up a most interesting finding: an ecological shift that produces a breakdown of the organic of interest, but at the same time produces a marked reduction in the efficiency of the system for degrading natural organics including sewage wastes. It appears that the microorganisms that thrive in the presence of the synthetic organic compounds under examination are relatively inefficient in utilization of other sources of carbon. Further, they displace the microorganisms that are efficient in the in the latter respect. This finding is significant. It discloses an impairment of the water resource by pesticides and other synthetic organic compounds not heretofore appreciated. The observation described may assist in explaining observed shifts in the nature of microbial communities in biological waste treatment plants. The sensitivity of such systems to industrial chemicals requires constant vigilance by plant operators. In the course of this work a microecosystem including tubificids, algae and protozoa and a higher plant was developed that may have value as a bioassay tool in testing toxicity of new chemicals.

A-020. Status:

Completed September, 1970.

A-021. OPTIMUM UTILIZATION AND MANAGEMENT OF WATERBEARING FORMATIONS HYDRAULICALLY-CONNECTED TO A STRETCH OF THE CONNECTICUT RIVER. Principal Investigator -- Dr. Ward S. Motts, Department of Geology. Project Initiated July, 1967.

Objective:

To develop procedures that would help achieve the maximum beneficial use of aquifers hydraulically connected to the Connecticut River in southern Massachusetts.

Accomplishments:

The study indicates the presence of two potential sources of ground water for expanding needs of the Greater Springfield area: (1) A buried channel of the ancient Connecticut River cut deeply into Triassic bedrock to depths of about 300 feet below present river levels. Parts of the channel are filled with gravel and sand that contain ground water under artesian head. The gravel and sand are covered by poorly-permeable silt and clay. The town of South Hadley obtains most of its water supply from the buried channel and there are indications of possible large water supplies in the channel in the South Springfield area. Future tests should be made to ascertain the total water available from the buried channel and the amount of recharge to the channel. (2) Shallow sand and gravel aquifers occurring in alluvium, glacial outwash, and glacial ice-contact deposits. Aquifers of large water yield occur in valleys west of Granby and in the Easthampton area between the Holyoke Range and the Berkshire Upland. A source of abundant ground-water supply occurs along the extensive wetland area west of Wilbraham, Massachusetts. A north-south ridge of bedrock has impounded this ground-water supply in a downgradient direction of the water table.

Ground-water recharge programs are not now feasible because there is little economic need; however, potential artificial recharge sites do occur in the Greater Springfield area. Programs of artificial recharge could be planned for recharging wells into thickened sand and gravel deposits of alluvium and glacial outwash that occur near Granby,

A-021. Accomplishments, Cont.

Easthampton, and Wilbraham. This study concluded that it may not be feasible to develop large ground-water supplies by inducing Connecticut River water into shallow aquifers through pumpage near the river. The alluvium in the aquifers directly connected to the Connecticut River do not have the permeability and storage capacity to allow ready transmission of large quantities of water.

Status:

Completed June, 1970.

A-022. CASE STUDY OF ATTITUDES OF COMMUNITY LEADERS TOWARD WATER POLLUTION ABATEMENT IN SELECTED MASSACHUSETTS COMMUNITIES ON THE CONNECTICUT RIVER (SPRINGFIELD-CHICOPEE AND SOUTH HADLEY). Principal Investigator -- Dr. Robert A. Shanley, Department of Government. Project Initiated April, 1967.

Objective:

To determine attitudes of community leaders towatd water pollution abatement in selected Massachusetts communities on the Connecticut River (Springfield-Chicopee and South Hadley).

Accomplishments:

Based on the reputational approach of determining community leaders, water pollution abatement ranked second in priority as a local environmental problem in Chicopee and Springfield and first by a narrow margin in South Hadley. In the Springfield-Chicopee-Holyoke metropolitan area, water pollution was termed the number one regional environmental problem by respondents in Springfield and South Hadley. In Chicopee where the pollution problem is understood to be most severe, respondents designated this problem as less important that solid wastes both as a local and regional problem.

A total of 70 persons were interviewed. An overwhelming majority of interviewees in the three communities were willing to study the feasibility of a metropolitan water pollution abatement district and supported

A-022. Accomplishments, Cont.

in principle, the creation of such a district. However, in discussing key provisions of the 1966 Massachusetts law permitting the creation of metropolitan abatement districts, reservations were registered concerning provisions of the law. Difficulty in obtaining agreement among key communities with various degrees of pollution and sewage treatment, the allocation of costs and mutual suspicion appeared to be obstacles in the creation of such a district.

The study indicated that a majority of the interviewees did not think Federal and State officials were active enough in abatement work. However, the respondents' level of information about government abatement activity was generally low.

A number of ecological factors appear to be related to the resistance that leaders in Chicopee offered to pollution abatement. These factors include: rate of population, median educational attainment of community, occupational profile, ethnic composition, and per capita assessed value. However, any relationship between those ecological factors which appear to be favorable or unfavorable to water pollution abatement must be considered tentative since only a limited number of communities were investigated.

Status:

Completed June, 1967.

A-023. See A-018D.

A-024. EVALUATION OF DISCONTINUITIES IN REGIONAL POPULATION PROJECTIONS. Principal Investigator -- Dr. Everett S. Lee, Department of Sociology. Project Initiated January, 1969.

Objectives:

To identify discontinuities that have occurred in population growth in various types of areas; to evaluate the efficiency of current methods of collection and use of population data for planning purposes; and to develop recommendations for improving the methodology applicable to metropolitan area water supply.

A-024. Accomplishments:

It has been determined that population projections come closest to census results or current estimates when (1) there is relatively little growth of population; (2) populations are declining; or when (3) in-migration and out-migration are approximately in balance. Projections have been least accurate where accuracy is most needed, that is, in areas experiencing rapid growth. These are found only when in-migration is considerable. Whereas errors of 5 per cent or less are usual in 10-year projections for other errors, errors of 15 per cent or more are not uncommon in areas of rapid in-migration. These are by and large in the suburban fringes of large cities. Actually, the seeming accuracy of projections for metropolitan areas has often resulted from opposing errors, the overestimation of central city growth, and the underestimation of suburban growth. In suburban areas, an element of discontinuity is found in the increasing amount of land per household. Over a 30-year period the average number of persons per acre in urbanized areas has fallen from about 12 to 7 with major impact upon utilities development. On the whole, the most successful projections for local areas have been derived by the ratio method. With this technique, projections are first made for a large area, after which estimates of the distribution of the population within smaller areas are made, taking into account changes in the distribution of economic opportunity and of various types of housing. Local population projection is not unlike weather forecasting; overall patterns must be taken into account, but a detailed knowledge of the local area is essential for projecting into the future.

Status:

Terminated June, 1970 (the Principal Investigator moved to the University of Georgia).

A-025. A LEGAL AND ECONOMIC EVALUATION OF GROUNDWATER USE IN MASSACHUSETTS. Principal Investigator -- Professor Robert H. Forste, Department of Agricultural and Food Economics.

Not activated. Project Director moved from the University of Massachusetts.

A-026. A STUDY OF THE RELATIONSHIP OF THE VASCULAR PLANT FLORA AND VEGETATION OF THE MILL RIVER AND ITS FLOODPLAIN IN NORTHAMPTON AND WILLIAMSBURG, MASSACHUSETTS TO PATTERNS OF LAND USE AND TO THE PRESENCE OF THE FAMILY PSEUDOMONADACEAE.

Principal Investigators -- Dr. Elizabeth D. Robinton and Dr. C. John Burk, Department of Biological Sciences, Smith College.

Project Initiated April, 1969.

Objectives:

To determine the relationship of patterns of land use in the areas adjacent to the Mill River, a stream which flows through five communities (Northampton, Florence, Leeds, Haydenville, and Williamsburg, Massachusetts) and its floodplain to the floras of vascular plants and selected microorganisms growing within the River or its floodplain.

Accomplishments:

An inventory of the species comprising the flora of vascular plants within the River and its floodplain was conducted. Studies of four marshy areas which have developed behind impoundments indicate that diversity and total coverage of vascular plant species decrease in all zones of the downstream marshes while the tendency towards large single-species stands increases. An Old World Species, Marsilea quadrifolia L., known to have escaped from cultivation some time after 1940 and since then established along the edges of Paradise Pond (Smith College Campus) and two miles downstream along a diversion channel of the River, invaded the lowermost (Arcadia Wildlife Sanctuary) marsh in 1969 and spread throughout the marsh during Summer, 1970. Quantitative measurements of this invasion have been made.

The nature and rate of invasion of the floor of an impoundment in the stream was investigated following the "letting out" of Paradise

A-026. Accomplishments, Cont.

Pond in June of 1969. Although a few descriptive studies of successional patterns on drying pond and lake bottoms have been reported, no previous quantitative data has been available. The data was contrasted with that from similar studies conducted on the floor of an impoundment which has been gradually drained over a period of years. Diversity and total biomass were found to increase with successional development, the total number of plants per unit area first increased with successional development and then decreased in later stages. Pseudomonas aeruginosa was isolated from several sampling points of the River and has been found to be associated with coliform pollution of the stream. Evaluation of isolation procedures, and characterization of organisms is in progress.

Status:

Continuing.

A-027. SURFACE WATERS OF A SMALL CITY (SPRINGFIELD, MASSACHUSETTS). Principal Investigator -- Dr. John W. Brainerd, Department of Biology, Springfield College. Project Initiated July, 1969.

Objective:

To determine the ecologic impact of a growing college community on a surface water resource.

Accomplishments:

The initiat task was necessarily directed to overcoming the difficulties experienced in organizing the resources of a small college to perform the research: improving an understanding of ecological stress on surface waters contained within the College community. It was found that before productive work could be done on ecologic stresses in the water resource, problems had to be solved regarding stresses within the staff of the College. These involved barriers to interdisciplinary work, pressures of teaching and other assignments, difficulty in communication among disciplines, competition for student and faculty

A-027. Accomplishments, Cont.

attention by social- non-ecologic problems. Little progress on the objectives of the research has so far been accomplished. However, the experience throws light on the role that a small College moy play in a regional program of water resource protection.

Status:

Continuing.

A-028. WATER RESOURCES POTENTIAL OF AN URBAN ESTUARY. Principal Investigator -- Dr. John J. Cochrane, Department of Civil Engineering, Northeastern University. Project Initiated July, 1969.

Objective:

To determine the degree of eutrophication in an urban estuary.

Accomplishments:

The study area for this project comprised the Saugus and Pines Rivers and Lynn Harbor, an area a few miles north of Boston. A number of eutrophic sites were found in the study area. The data obtained indicated high correlation between water quality and algal growth in this estuarine environment.

An important part of this study was the development of a laboratory culturing system to determine the optimum conditions for growth of the marine algae, Ulva latissima, to allow comparisons with the conditions found in the field. Successful cultures were obtained through the utilization of a continuous salt water flow system designed to allow adjustments amenable to maintenance of desired chemical and physical parameters. The growth of Ulva as a function of varying nutrient concentrations was studied. It was determined that optimum growth occurred at a nitrogen (NH_4): phosphorous (PO_4) ratio of 50:1. Variations in nutrient levels at each sampling location were determined and compared with the laboratory findings. The effects of tide conditions and of adjacent stations were studied.

An investigation of the contribution of bottom deposits to nutrient concentrations in the overlying waters was also made through laboratory

A-028. Accomplishments, Cont.

experiments. A flow tank containing typical bottom sediments from the rivers and harbor complex was run continuously for five weeks. It was determined that measurable quantities of phosphate were released from sediment layers several centimeters below the interface and that the contribution of bottom deposits to algal production is potentially significant. This was borne out by the high correlation coefficient between phosphorous concentrations in lower water layers and high incidence of Ulva growth.

Status:

Completed June, 1970.

A-029. EVALUATION OF EXISTING COMPUTER MODELS FOR ADAPTATION TO EDUCATIONAL PROGRAMS ON WATER RESOURCES MANAGEMENT. Principal Investigator -- Dr. Eugene E. Kaczka, Department of General Business and Finance. Project Initiated February, 1970.

Objective:

To develop a set of computer programs and problems for use in graduate courses applying management science techniques to water resources management.

Accomplishments:

The project to date has generated the following: (1) The acquisition of a computer model of a multi-reservoir river basis titled HEC-3 RESERVOIR SYSTEM ANALYSIS, Program Number 23-53, Hydrologic Engineering Center, U.S. Army Corps of Engineers. This program is operating on the one bank system. (2) The acquisition of a second computer model for simulating river basin systems, titled MATHEMATICAL MODEL PROGRAM FOR SIMULATION OF RIVER BASIN SYSTEMS-VERSION 7, written by David Hellstrom, New England Division, U.S. Army Corps of Engineers. (3) A FORTRAN program to perform PERT analysis has been implemented on the time-sharing system. (4) Data from two articles dealing with a linear program approach to river pollution are being combined with a linear program

A-029. Accomplishments, Cont.

package to form a demonstration of this technique. (5) A number of articles dealing with many phases of the 'quantitative assault' on water resource problems have been collected.

Status:

Continuing.

A-030. OPTIMAL APPLICATION OF UNIVERSITY RESOURCES TO ASSIST PUBLIC AGENCIES ON WATER PROBLEMS. Principal Investigator -- Dr. Carl A. Carlozzi, Department of Forestry and Wildlife Management. Project Initiated April, 1970.

Objectives:

To identify and analyze the constraints experienced by a State University in responding to public agency requests for assistance in the water resource fields and to recommend policies and procedures which would constitute a basis for a most desirable State University Program of public service in the water resources field.

Accomplishments:

A questionnaire was sent to Water Resources Research Centers and Institutes throughout the country. Responses have been received and data correlation has begun, preliminary results of which should be ready in April or May , 1971.

Separate questionnaires have been sent to Massachusetts State officials, persons conducting inter-disciplinary work at the University of Massachusetts, and people connected with public service agencies in the State, asking for opinions on educational value, organizational structure and funding responsibility.

Interviews are being held with those persons who indicated a desire to go into greater detail than the questionnaires presented as well as those with whom it would be valuable to consult based on their response to the questionnaires.

A-030. Accomplishments, Cont.

In depth studies of other "outreach" programs are being carried out. Legal aspects of the University's relationship to outside organizations where help could be extended are also underconsideration.

Status:

Continuing.

A-031. EVALUATION OF PUBLIC POLICY ALTERNATIVES IN MAXIMIZING PUBLIC BENEFITS ARISING FROM WATER QUALITY IMPROVEMENT. Principal Investigator -- Professor John H. Martin, Department of Landscape Architecture. Project Initiated July, 1970.

Objectives:

To provide basis for estimating the increased values of water-related lands resulting from water quality improvements; to identify the beneficiaries of the increased values under prevailing public policy on land use; to describe alternative stragegies by means of which the increased values may produce maximum public benefit; and to recommend a basis for prudent public policy.

Accomplishments:

The project has only recently been initiated.

Status:

Continuing.

A-032. OPTIMIZING STRATEGY FOR STATE WATER POLLUTION CONTROL IN THE POST "PLAN OF IMPLEMENTATION" PERIOD. Principal Investigator -- Professor Bernard B. Berger, Water Resources Research Center. Project Initiated July, 1970.

A-032. Objectives:

To detail the essential features of effective institutions for regional or basin-wide water quality management; to describe the special considerations in applying such institutions in Massachusetts; and to propose a strategy for evaluating alternative institutions in regionalizing water quality control fitted to the conditions in Massachusetts.

Accomplishments:

This is a new project which was only recently initiated.

Status:

Continuing.

A-033. ASSESSMENT OF CHEMICAL POLLUTANTS IN UNDERWATER EXHAUST OF WATERCRAFT ENGINEERING. Principal Investigator -- Dr. Lawrence N. Kuzminski, Department of Civil Engineering.

Not activated. Project supported totally by State of Massachusetts.

A-034. EVALUATION OF A METHOD OF CHARACTERIZING THE PONDED WATERS OF MASSACHUSETTS. Principal Investigator -- Dr. James A. McCann, Department of Forestry and Wildlife Management. Project Initiated May, 1970.

Objectives:

To develop a method of profiling the physical, chemical, biological, and land-water use characteristics of the ponds, lakes, and reservoirs of Massachusetts.

Accomplishments:

The Barnstable County report, the first of a proposed series of published inventories, has been circulated to the major State water resources agencies for their evaluation of the method of data presentation. As their

A-034. Accomplishments, Cont.

replies are obtained and analyzed, modifications will be made on the format of all subsequent county inventories. Approximately 90 percent of the data on the ponds, lakes and reservoirs of six counties has been compiled and prepared for publication. About 75 percent of the data on the remaining counties has been collected. To date, the major effort has concentrated on compiling the data. Subsequent reports will reflect the comments received on data presentation and will represent a recommended format for profiling standing waters.

Status:

Continuing.

A-035. A STUDY OF THE POSSIBLE EFFECTS OF ORGANOCHLORINE PESTICIDES ON PRIMARY PRODUCTIVITY AND SKELETOGENESIS OF NEW ENGLAND ESTUARINE AND COASTAL MARINE ALGAE. Principal Investigator -- Professor Charles S. Yentsch, Department of Marine Sciences, Marine Station - U.M., Gloucester. Project Initiated August, 1971.

Objectives:

To determine the extent to which organochlorine pesticides affect (a) primary productivity in coastal and estuarine fleshy algae, and (b) calcium carbonate deposition in crustose coralline red algae.

Accomplishments:

Natural populations of corallines suitable for in situ experimental studies of primary productivity and calcium carbonate deposition have been located on rock and shell during exploratory dives adjacent to the Marine Station. Algal spores are released from December - February. Concrete stanchions, each supporting glass slides and plexiglass plates, have been placed over natural populations

A-035. Accomplishments, Cont.

to obtain young corallines suitable for *in situ* and laboratory experiments during late spring.

Cultured populations of two fast growing filamentous algae (*Spermothamnion repens* and *Derbesia marina*) have been isolated in laboratory culture and are being grown in quantity; a third algal species will be isolated from the Anisquam River estuary as soon as the thick ice cover leaves this body of water.

Base rates of photosynthesis and respiration will be measured for cultured and *in situ* field specimens using C-14 labeling techniques and by polarographic oxygen determination.

A-036. THE ROLE OF COASTAL MARSHES IN PHYSICAL RESTRICTION OF SEAWARD FLOW OF FRESH GROUND WATER. Principal Investigator -- Dr. Norton H. Nickerson, Department of Biology, Tufts University. Project Initiated September, 1970.

Objective:

To determine the role of coastal marshes in physical restriction of seaward flow of fresh ground water.

Accomplishments:

Data are being obtained on the presence or absence of fresh water at various distances from upland and at various depths in the peat in seaside marshes inundated by tidal ocean waters. Holes have been drilled in marshland with a soil augur. Water samples at ground-water level are being obtained with a small plastic pump. These samples are measured on a Beckman conductivity bridge to determine conductivity and by a conversion factor, chloride content. These data are then being related to seawater on one end of a scale and fresh water on the other. Correlations are also being made with surface vegetation and known habitats of greenhead fly larvae.

Status:

Continuing.

A-037. THE ORIGIN, EFFECTS AND CONTROL OF TURBIDITY IN AN URBAN RECREATIONAL LAKE. Principal Investigator -- Dr. Stanley M. Bemben, Department of Civil Engineering. Project Initiated September, 1970.

Objective:

To identify and characterize the origins of turbidity in an urban recreational lake.

Accomplishments:

Lake turbidity studies have been on-going since September of 1970 at Mountain Lake in Chicopee, Massachusetts. During this time an inventory of potential turbidity forming sources has been completed in the heavily urbanized watershed above Mountain Lake. The chemical nature of the streams and Mountain Lake which have thus far been studied include pH, temperature, color, total hardness, iron, copper, specific conductance, turbidity, sulfates, dissolved oxygen, and carbon dioxide. Bacterial analysis of storm waters for total bacteria and total coliforms has also been studied. Important tentative conclusions thus far reached show (1) background turbidities for Mountain Lake are approximately 4-10 JTU, increasing during Fall and Winter overturns, and after heavy rains to 11-25 JTU, and occasionally reaching 90 JTU. Storm waters are frequently in excess of 250 JTU and ponded street waters have turbidities as high as 4000 JTU; (2) increased total hardness during the leaf-fall season are due to the release of magnesium from chlorophyl; (3) storm waters are characterized by high bacterial counts not necessarily of the coliform group, and high concentrations of iron and copper (up to 25 ppm for each); (4) absence of algal problems is related to the high copper content (1-2 ppm) in the lake waters. Future research will include suspended and total solids, total organic carbon, B.O.D. and C.O.D., manganese, ferrous iron, chromate, mercury and phosphate studies. Analyses of benthic deposits of Mountain Lake will also be attempted when the Lake will be drained for a scheduled cleaning in the early Spring, 1971.

Status:

Continuing.

A-038. EFFECTS OF WATER DIVERSION ON ESTUARINE FAUNA IN MERRIMACK RIVER, MASSACHUSETTS. Principal Investigator -- Dr. Charles F. Cole, Department of Forestry and Wildlife Management. Project Initiated February, 1971.

Objective:

To determine the effect of proposed diversions of fresh water from the Merrimack River on the estuarine organisms dependent on these waters to dilute the marine waters at the mouth of the estuary.

Accomplishments:

This is a new project which has been initiated recently.

Status:

Continuing.

Matching Grant Projects

B-003. INSTITUTIONAL PATTERNS FOR EVOLVING REGIONAL PROGRAMS FOR WATER RESOURCE MANAGEMENT. Principal Investigator -- Dr. Irving Howards, Department of Government. Project Initiated July, 1967.

Objectives:

(1) To provide empirical evidence that the implementation of a water resource management plan inevitably excites the concern of a variety of governmental and private groups within the affected area. (2) To demonstrate that regardless of the existence of technological and scientific evidence this institutional environment must be perceived and fully understood if water resource management is to be successfully implemented. (3) To demonstrate that groups within the various institutional environments react with enough uniformity to be useful to those who must anticipate how much such groups will affect water resource management. (4) To demonstrate that useful uniformities of institutional reaction to water resource management can be obtained from case studies carefully chosen to replicate as many examples as practicable of the "real world" situations. (5) From this technique, to determine common threads or principles of action which lead to success or failure of specific water development or management proposals.

Accomplishments:

In general, results do not confirm the presumption that "implementation of a water resource management plan inevitably excites the concern of a variety of governmental and private groups within the affected area". Neither planning nor implementation excites private group interest unless such groups are directly affected. Furthermore, actual effect is often at odds with perceived effect. In most instances, public apathy rules. Because being well-informed about the technical aspects of water resource planning and development is not usually prerequisite to the attainment of political goals, consulting engineers are often able literally to dictate both what alternatives will be considered and the detailed plans to be adopted.

B-003. Accomplishments, Cont.

Perhaps the most far-reaching and important finding of this study was that there is a surprisingly unexplainable gap between decisions and the outcomes of decisions. Put another way, traditional means for studying the decision-making process do not yield data sufficient to explain what actually occurs in the long run. Institutional constraints on decision-making were found to be vital if one seeks to understand conflict or cooperation, but such constraints provide only a partial means for explaining how water resources are actually developed in the last analysis.

The study found evidence to support the following three generalizations: (1) Where two or more groups or jurisdictions seek use of one water resource for conflicting purposes, the group or jurisdiction with the clearest immediate need tends to "win" the right to use that resource regardless of its political power or institutional "muscle". (2) Issue awareness is a phenomenon subject to political rather than institutional forces. The most ingenious institutional arrangements cannot elevate a need to issue status without concomitant political initiative. (3) Interjurisdictional cooperation tends to decrease as common need increases.

The study was undertaken in the expectation of finding that "good" plans tend to be emasculated in the political process. It was also hoped that the study might achieve a set of rules which, if applied, might assure a plan's acceptance on the basis of intrinsic merit. Instances were indeed found of delay and "unnecessary" conflict attributable both to faulty institutional arrangements and political maneuvering. However, these forces were found to be both relatively temporary and relatively unimportant. Almost invariably, delays brought about by these factors tended to have little lasting effect. Of greater significance was this study's finding that outcomes of water resource decisions are related to the socio-economic and political characteristics of the communities from which they eminate.

Status:

Completed October, 1970.

B-004. PROGRAMMED SELECTION OF OPTIMUM USES OF A SMALL WATER RESOURCE SUBJECTED TO SIMULTANEOUS DEMAND STRESSES. Principal Investigator -- Dr. Carl A. Carlozzi, Department of Forestry and Wildlife Management. Project Initiated July, 1967.

Objectives:

(1) To develop methods for relating the demand-supply information to determine present or anticipated stress on the water resource. (2) To simulate alternative use schedules and management inputs and test for optimum economic choices under various theoretical management and use schemes. (3) To develop methods for the graphic interpretation on watershed maps of probably sequential changes in the supply-demand relationships among the major water users by public and private economic sectors, geographic location, demographic features, and management inputs to 1977. (4) To develop methods for expressing the graphic information derived as a series of alternatives for choice in integrated watershed planning. (5) To develop a computer graphics program that has applicability to integrated watershed planning generally and that can present complex multivariate economic and statistical data in a form easily assimilable and meaningful to planners and decision-makers in public and private roles.

Accomplishments:

An economic input-output analysis of the watershed region was used to provide an up-to-date economic base line of conditions in the watershed against which hypothetical changes in water and land uses were tested. This analysis was applied to the study of manufacturing factors in forest management and forest industry development.

The wood products industry was studied with respect to water use, raw materials use and origin, growth potential, projection of water use in absolute terms and anticipated change in needs. This information was used in making hypothetical shifts in raw materials origination from outside the watershed to inside the watershed, and in relating these shifts to changes in land use and forest management.

B-004. Accomplishments, Cont.

A shift to deriving wood and wood fiber from watershed sources was examined in respect to impact on the composition of forest types, forestry height classes and crown closure, and to subsequent effects on the energy budget of large areas of the watershed and factors such as evapo-transpiration, snow sublimination, and surface runoff.

The factors of energy from the sun were measured over various vegetation community types in order to determine the present energy budget base line for the watershed based on the response to entropy by two warm blooded animals common to the watershed forest -- the white-tailed deer and the ruffed grouse. Data on the physical and chemical characteristics of the water, and the existence and distribution of the River's biota were used to determine recreational potential and fisheries management requirements.

The program employed the SYMAP (synagraphic computer mapping program) format. Program feasibility tests were based on data obtained through field investigations and sources such as State and local agencies. We can not yet report that SYMAP is an effective integrating mechanism in watershed planning and management.

Status:

Completed December 31, 1970.

B-005. CONTROL OF BENTHIC DEPOSITS IN LAKES. Principal Investigator -- Dr. T. H. Feng, Department of Civil Engineering. Project Initiated July, 1967.

Objective:

To identify the conditions under which phosphorus compounds in bottom deposits of lakes are released to the overlying waters, and to determine the practicality of controlling this deposit.

B-005. Accomplishments:

Information has been obtained on the rates at which nutrient chemicals are released from such deposits into quiescent overlying waters and the environmental conditions influencing these rates. In the research already completed, the laboratory conditions were designed to simulate thermally stratified lakes in which mixing effects were not an important factor in the kinetics of the nutrient release by the benthic deposit. Most lakes in Massachusetts, however, are shallow and thermal stratification effects are absent or are poorly defined. In shallow lakes, bottom currents are induced by surface winds. Such currents produce mixing effects that may have important effects on the rate of nutrient release. It is expected that data now being obtained will define the influence of bottom currents on the kinetics of nutrient release from benthic deposits. These findings will have an important bearing on the utility of concentrating bottom deposits by jets producing laminar flow. In quiescent systems it has been found that jets producing laminar flow will concentrate the bottom deposit without significant release of phosphate to the overlying water. Such deposits may then be removed by vacuum dredging with little impairment of the lake.

Status:

Completed December, 1970.

B-006. MICROBIAL INTERVENTION IN THE EUTROPHICATION PROCESS. Principal Investigator -- Dr. Warren Litsky, Department of Environmental Sciences, U.M. and Dr. John T. Reynolds, Department of Biology, Clark University. Project Initiated July, 1967.

Objective:

To determine whether manipulation of microbial communities may be useful in retarding the eutrophication process in lakes. If the process of decomposition of algae and other aquatic plants may be retarded during periods when successive blooms of nuisance algae normally occur, it is conceivable that the resulting slow-up in nutrient recycling may reduce or eliminate this nuisance.

B-006. Accomplishments:

No clue was found to the riddle of reducing eutrophication by manipulation of microorganisms involved in the decomposition process. The eutrophication process could be retarded if dead plant life were not rapidly decomposed. It would of course be practically impossible to stop decomposition entirely under field conditions. However, the objective was not to do this, but rather to displace efficient cellulolytic decomposers with microbes that are less efficient, or to manipulate activity of normal decomposers so that it was out of phase with environmental conditions that promote algal growth. As in most projects, new knowledge was obtained and new techniques developed that have value beyond the immediate objective of the project. In this case, a useful presumptive test has been developed for detecting and enumerating cellulolytic bacteria. The technique will be generally useful for persons who are studying the microbiology of lakes. In addition, much information of interest was obtained on the activity of cellulolytic bacteria in clean lake waters, as represented by Quabbin Reservoir.

Status:

Completed June, 1970.

B-008. WATERSHED RESPONSE TO HYDROLOGIC INFLUENCES. Principal Investigators -- Professor G. R. Higgins, Department of Civil Engineering and Dr. J. M. Colonell, Department of Civil Engineering. Project Initiated July, 1968.

Objectives:

(1) To summarize hydrologic response functions for drainage basins in Massachusetts in relation to their impact on watershed yield. (2) To assess data on evaporation from Quabbin Reservoir and apply this data to the yield study. (3) To evaluate existing theories on thermal stratification for their applicability to lakes in Massachusetts.

B-008. Accomplishments:

In Massachusetts, most public water supplies are derived from surface water sources and therefore studies have been largely focussed on this type of resource. Early phases of the work led to establishment of storage-yield relationships from gauged streams. These were published in a widely distributed interim Report entitled "Yield of Streams in Massachusetts". The data included estimates on the size of a reservoir required to provide sustained desired yields. The current phase of research focuses on evaporation from reservoirs. This is important because creation of a reservoir normally increases the "evaporation opportunity" and decreases annual stream flow. Analysis of reservoir evaporation has yielded data that can be applied to studies on thermal stratification of water bodies. The "layering" effect is important because the quality of a lake's water may vary significantly with depth. In recent years, methods have been developed to predict thermal stratification by mathematical modelling and laboratory simulations. However, field data required by these models have been quite limited. The investigations which are being conducted on Quabbin Reservoir should help in developing a useful technique for predicting stratification phenomena for this important water resource. This research project will provide hydrologic response maps for Massachusetts, storage-yield relationships including effects of reservoir evaporation, and results of application of modelling techniques dealing with reservoir stratification. It will also include an assessment of the 1961-1967 drought and its effect on engineering design criteria.

Status:

Continuing.

B-010. ENHANCEMENT OF ECOLOGIC AND AESTHETIC VALUES OF WETLANDS ASSOCIATED WITH INTERSTATE HIGHWAYS. Principal Investigator -- Dr. Carl A. Carlozzi, Department of Forestry and Wildlife Management. Project Initiated July, 1968.

B-010. Objectives:

(1) To develop design and management criteria for protecting coastal wetlands and developing small water impoundments in conjunction with Federal Interstate Highway Construction in relation to wildlife and fish habitat improvement in Massachusetts and Southern New England. (2) To develop visual-aesthetic design and management criteria for such impoundments and wetlands in relation to highway beautification. (3) To examine existing statutory, institutional and administrative provisions and their application and improvement in order to create a procedure for implementing the design and management proposals in the Interstate Highway Program.

Accomplishments:

Examination of the impact of ecological potential of water resources influenced by major highways developed is completed with respect to field investigations in four areas in inquiry. Two investigations concerned the physical, chemical and biological factors as they are seen in the typical landscape conditions encountered by highway builders in southern New England. The major value of this investigation was the creation of predictive information so that further extension of the highway system can minimize negative changes in water resources and maximize positive resource values. Guidelines have been proposed to assist highway planners, designers, and builders in creating water bodies with high potential for fisheries and wildlife by tying landscape characteristics and ecological needs together and demonstrating where highway building can effectively create fish and wildlife habitats. Criteria and guidelines derived from these studies have been incorporated in such a way that it is now possible to optimize water resource value at any singular point along the highway or generally throughout the regional highway system. The investigation of the legal and administrative framework in which water resource change would be placed focussed on the highway planning and decision-making process as it is currently carried out with the Federal and State agencies. It further examined the administrative role of Federal, State and local agencies which have been given responsibility for the control and maintenance of water resources designed and created in association with highways.

Status:

Completed March, 1971.

B-011. A METHODOLOGY FOR PLANNING OPTIMAL REGIONAL WASTE MANAGEMENT SYSTEMS. Principal Investigators -- Dr. D. D. Adrian, Department of Civil Engineering, and Drs. R. J. Giglio, F. C. Kaminsky and R. F. Rikkers of the Department of Industrial Engineering. Project Initiated July, 1968.

Objective:

To develop a long-range planning methodology for regional wastewater treatment systems designed to help planners answer the following questions: (1) Which communities and/or industries should be served by a common treatment facility? (2) Where should treatment facilities be located? (3) How large should the plants be? (4) What level of treatment should be provided at each location? (5) How should expansion be sequenced through time? (6) How can costs (or savings) be allocated most equitably to the individual political and industrial contributors of wastewater in the region?

Accomplishments:

A number of projects have been undertaken to accomplish the goals of this research. The major projects (and the status of each) are listed below: (1) A mathematical-computer procedure has been developed to help answer questions 1 - 4 above. This procedure is a heuristic algorithm which seeks a minimum cost plan based on effluent standards. (2) A practical and rational methodology for generating a projection of the volume and distribution of wastewater in a region over time has been developed. (3) A study of wastewater quality changes within an interceptor and ways to increase flow in an interceptor is completed. (4) An investigation of the effects on cost and stream quality of discharging effluent through outfalls spaced along a river is completed. An algorithm has been developed to select the optimal location of the outfalls. (5) A mathematical-computer technique for finding the optimal route for pipelines which connect several sources of wastewater to a treatment facility is under development. (6) A technique for equitably allocating the costs of a regional wastewater system among the communities which share facilities is under development.

Status:

Continuing.

B-012. A MULTI-VARIATE MODEL FOR PUBLIC MANAGEMENT OF FRESHWATER WETLANDS. Principal Investigator -- Dr. J. S. Larson, Department of Forestry and Wildlife Management. Project Initiated July, 1969.

Objective:

To produce a decision-making model for public management of freshwater wetlands considering rates and patterns of land use change in wetlands, hydrogeology, wildlife, visual-social values and economics.

Accomplishments:

Changes in wetland use over the past 20 years in Massachusetts are being used to detect significant patterns and rates of change for the various wetland types and to develop predictors of change for the next two decades. Aerial photographic interpretation is the main tool being used in this phase.

Studies of water budgets and surficial geology of wetlands are being conducted to better relate them to the patterns of groundwater supply, present and potential. Relationships between wetland location and the underlying surficial geology, plus detailed studies of sample areas, are the chief approaches being used in this phase.

Wildlife values of wetlands are directly related to vegetative diversity and form, and to nutrient supply. Broad classifications of wetland vegetative types are being subdivided into sub-classes more meaningful in terms of wild mammal and bird species. Natural and man-influenced succession in wetlands are being examined as is basic nutrient supply.

Wetlands as major components of physiographic and hydrologic systems have a potential role in regional planning. The visual impact of wetlands on the landscape has not been evaluated. Yet, wetlands appear to have a valuable role to play as physical components of diversity both on the broad landscape and in the local environment. Identification of the diverse visual attributes of wetlands and tests of the reaction of the public to these attributes are important activities in this phase.

B-012. Accomplishments, Cont.

The economics sub-project draws from the other sub-projects values associated with maintaining natural wetlands and contrasts these with the values of alternative uses of wetlands. Examination of the ownership, regulation and other institutional aspects of wetlands, plus market values are approaches being used in the economics phase.

Progress to date has developed an impressive fact base in some areas and identified needs for knowledge in others. A common framework for investigation amenable to all disciplines has been evolved and promises to generate an integrated decision-making model as the end-product.

Status:

Continuing.

B-014. PLANNING FOR CAPACITY EXPANSION OF WATER DISTRIBUTION NETWORKS. Principal Investigator -- Dr. John C. Schaake, Jr., Department of Civil Engineering, Massachusetts Institute of Technology. Project Initiated July, 1969.

Objective:

To develop methods useful in planning for capacity expansion of a water distribution network, over a given planning time horizon, which is capable of meeting a growing, uncertain demand for water at adequate pressure.

Accomplishments:

It was demonstrated that the optimal present investment decisions could be related to the annual discount rate, economy-of-scale in the cost of capacity expansion, existing network capacity, and the demand growth patterns. An important question of network planning

B-014. Accomplishments, Cont.

for uncertain future demands was investigated. The first part was to explore the general nature of water distribution network planning; the second part was to study the problem of single period planning for a tree network; the third part was a dynamic programming application to the problem of multi-period, single component planning; and, the last part was the development of a model for tree network planning which essentially combined the approaches studied in the second and third parts.

Status:

Completed October 15, 1970.

B-015. AN URBAN RIVER IN ITS CHANGING CULTURE. Principal Investigators -- Dr. Carl A. Carlozzi and Dr. John W. Sinton, Department of Forestry and Wildlife Management. Project Initiated July, 1969.

Objectives:

(1) To identify and study the functional changes of the Charles River over the past 100 years. (2) To examine the past and present attitudes of watershed residents toward the Charles. (3) To examine the attitudes of decision-makers toward the Charles. (4) To make this socio-cultural data relevant to planning purposes.

Accomplishments:

An investigation of State laws, public hearings, old newspapers, and other pertinent literature disclosed that public attitudes toward the Charles have run the gamut from hatred to love and beautiful to ugly. One of the major theses that has emerged out of this study is that attitudes themselves do not change over time; what does change is the emphasis on one value or another; for instance, 100 years ago people were more likely to find beauty than ugliness in the Charles River, but both attitudes of beauty and ugliness were represented. Beauty and ugliness are still represented in present attitudes, but the emphasis has changed to ugliness.

B-015. Accomplishments, Cont.

Present day attitudes were gauged by a questionnaire distributed to more than 1000 residents from the towns of Milford, Sherborn, Dover, Needham and Watertown. The five towns were chosen to reflect both regional and socio-economic differences within the basin. A survey was also given to decision makers in the above five towns to provide a basis for comparison between these and the attitudes of the public at large.

This study will conclude with a section on recent plans for the Charles River and how these plans will benefit from the socio-cultural material in the rest of the study.

Status:

Continuing.

B-017. DEVELOPING METHODOLOGY FOR INCLUDING INTANGIBLES IN BENEFIT-COST ANALYSIS OF WATER RESOURCE PROJECTS. Principal Investigators -- Dr. J. B. Wyckoff, Department of Agricultural and Food Economics and Professor Robert L. Vertrees, Department of Agricultural and Food Economics. Project Initiated July, 1970.

Objectives:

(1) To develop methodology to measure the "value" of intangible benefits by determining intensity of satisfaction of users of water resource projects. (2) To develop procedures for incorporating such values into benefit-cost analysis of water resource projects.

Accomplishments:

Various research techniques have been utilized in attempts to measure the intensity of satisfaction of consumers of intangible benefits of water resource projects. There are several techniques for doing this which a priori appear to warrant further study:

B-017. Accomplishments, Cont.

(1) Testing the relative satisfaction which an individual gains from a variety of visual experiences would appear to be useful. (2) Utilizing "semantic scaling", a technique that results in ordering of a person's reactions to various aesthetic experiences related to water resource projects. (3) Utilizing hypothetical value comparisons to form value sets which could be designed to measure the relative (or absolute) values persons mentally assigned to alternative choices among aesthetic experiences, (e.g. trade-offs between open green space and subdivisions, or a mountain valley and a reservoir). (4) Studying the benefit-cost analysis of selected existing projects and comparing these with the estimated real values which have accrued from the project to permit determination of categories of benefits and costs that were a priori inaccurately estimated.

Status:

Continuing.

B-018. ATTITUDES, VALUES AND PERCEPTIONS IN WATER RESOURCE DECISION-MAKING WITHIN A METROPOLITAN AREA. Principal Investigator -- Dr. Irving Howards, Department of Government. Project Initiated October, 1970.

Objectives:

To study the attitudes, values and perceptions of the population of the Springfield metropolitan area in respect to water resources programs.

Accomplishments:

This project has just recently been initiated. Plans are being prepared for an intensive investigation of values, attitudes, and perceptions in the Springfield metropolitan area. This will be based on interviews with: (1) local leaders, (2) local water resource decision-makers (whether local leaders or not), (3) representative samples of groups with special interests

B-018. Accomplishments, Cont.

in water resource decisions, and (4) representative samples of ordinary citizens at large who have no special interest in water resources. The plans will encompass a clear definition of the metropolitan area and an exhaustive investigation of past water resource decisions and present water resource management and planning in the area.

Status:

Continuing.

Title II Project

C-2169 FORMATION OF PUBLIC POLICY ON ISSUE OF OUT-OF-BASIN DIVERSION OF CONNECTICUT RIVER FLOOD WATERS TO BOSTON METROPOLITAN AREA. Principal Investigator -- Professor Bernard B. Berger, Water Resources Research Center. Project Initiated October, 1970.

Objectives:

The objectives of this project are twofold: to determine how public policy on this proposed inter-basin water transfer has evolved, and to determine the nature and range of effects that may be produced by diversion of flood waters. Each of these objectives is presented in terms of a set of detailed questions considered to be timely and important:

1. How does public policy evolve in respect to this inter-basin transfer of water? Subordinate questions are:

    a. How did the various interested public groups form their opinions on this controversial issue?

    b. How did the attitudes of these public groups change in time and what factors accounted for these changes?

    c. How effective were public hearings in providing an opportunity for expression of public opinion?

    d. What factors most strongly influenced the attitudes of the members of the special task force assigned by the General Court to the study of the proposed legislation?

2. What consequences in the Connecticut River Basin may reasonably be associated with diversions out-of-the basin? Subordinate questions are:

C-2169 Objectives, Cont.

a. What is the role of flood flows in scouring bottom deposits?

b. What is the role of spring and autumnal flood flows in triggering movements of anadromous fish?

c. What is the role of flood flows in nutrient supply and removal?

d. What is the role of flood flows in the pollution of the river and its amelioration?

e. What is the influence of flood flows on the ecology of tidal and estuarial water?

f. What are the long-term water supply requirements of the basin region?

g. What is the role of Connecticut River flood flows in recharging regional groundwater aquifers important to the region?

Accomplishments:

The studies related to Objective 1 of the project have recently been initiated. The seven studies related to Objective 2 of the project are approaching completion. An evaluation of data is under way.

Status:

Continuing.

APPENDIX III

LISTING OF PUBLICATIONS

A-001 -- "A Survey and Evaluation of Small Artificial Recreational Ponds in Central Massachusetts" James A. McCann

Completion Report

McCann, James A. AN INVENTORY OF THE PONDS, LAKES, AND RESERVOIRS OF MASSACHUSETTS -- BARNSTABLE COUNTY. Water Resources Research Center Publication No. 10-1, University of Massachusetts, Amherst, Massachusetts. December, 1969. 102 pages.

Masters and Doctoral Theses

Scofield, Larry R. A SURVEY OF SMALL ARTIFICIAL PONDS IN HAMPSHIRE COUNTY, MASSACHUSETTS. Thesis -- M.S. August, 1968. 106 pages.

Zanella, Eugene F. A LIMNOLOGICAL SURVEY OF TWELVE ARTIFICIAL PONDS OF HAMPSHIRE COUNTY, MASSACHUSETTS. Thesis -- M.S. September, 1967. 118 pages.

A-002 -- "The Ecology of the Young Fishes of the Weweantic River Estuary" Charles F. Cole

Completion Report

Cole, Charles F. THE ECOLOGY OF THE YOUNG FISHES OF THE,WEWEANTIC RIVER ESTUARY. Water Resources Research Center Completion Report, November, 1969.

Journal Articles

Cole, Charles F. CAN MORTALITY RATES BE DETERMINED FOR ESTUARINE ICHTHYOPLANKTON POPULATIONS. Symposium on Eggs, Larvae and Juvenile Stages of Fishes in Atlantic Coast Estuaries, June 11, 1968. Charleston, South Carolina. To be published by Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service.

Cole, Charles F. RESEARCH ON ESTUARINE FISHES AND PESTICIDE RESIDUES IN MASSACHUSETTS WATERS. Proceedings of the Public Meeting, October 8, 1968. Boston, Massachusetts. National Estuarine Pollution Study, FWPCA, pp. 81-85.

Cole, Charles F. PESTICIDE MONITORING STUDY IN WINTER FLOUNDER INHABITING THE WEWEANTIC ESTUARY IN MASSACHUSETTS. Proceedings, Training Course on Mosquitoes, Biting Flies, Ticks and Safe Pesticide Application, December 12-14, 1968. Westboro, Massachusetts. pp. 57-62.

Lebida, Robert C. THE SEASONAL ABUNDANCE AND DISTRIBUTION OF EGGS, LARVAE, AND JUVENILE FISHES IN THE WEWEANTIC RIVER ESTUARY, MASSACHUSETTS, 1966. -- Abstract. Symposium on Eggs, Larvae and Juvenile Stages of Fishes in Atlantic Coast Estuaries, June 11, 1968. Charleston, South Carolina.

Masters and Doctoral Theses

A-002 (cont'd)

Lebida, Robert C. THE SEASONAL ABUNDANCE AND DISTRIBUTION OF EGGS, LARVAE, AND JUVENILE FISHES IN THE WEWEANTIC RIVER ESTUARY, MASSACHUSETTS, 1966. Thesis -- M.S. September, 1969.

Smith, Roderick M. THE OCCURRENCE, DYNAMICS AND SIGNIFICANCE OF CHLORINATED HYDROCARBON INSECTICIDE RESIDUES IN THE TISSUES OF WINTER FLOUNDER, PSEUDOPLEURONECTES AMERICANUS (WALBAUM) FROM THE WEWEANTIC RIVER ESTUARY, MASSACHUSETTS. Thesis -- M.S. 38 pages.

A-003 -- "Hydrological Studies in Massachusetts" George R. Higgins

Termination Report

Higgins, G. R. HYDROLOGICAL STUDIES IN MASSACHUSETTS -- A TERMINAL REPORT ON PROJECT WR-3, JUNE 30, 1968. Publication No. 6, Water Resources Research Center, July, 1968. 36 pages plus Appendix A.

Other Publications

Higgins, G. R. YIELD OF STREAMS IN MASSACHUSETTS -- AN INTERIM REPORT, March, 1967. Bulletin, University of Massachusetts, Amherst, Massachusetts. June, 1967. 175 pages.

A-004 -- "Pilot Study of the Occurrence and Characteristics of Shallow-Aquifer in Massachusetts" Ward S. Motts

Completion Report

Motts, Ward S. and Saines, Marvin. THE OCCURRENCE AND CHARACTERISTICS OF GROUND-WATER CONTAMINATION IN MASSACHUSETTS. Water Resources Research Center Publication No. 7, January, 1969. 70 pages.

A-005 -- "Development of Methods for Increasing Efficiency of Water Use in Cranberry Culture" John S. Norton

Completion Report

Norton, John S., DEVELOPMENT OF METHODS FOR INCREASING EFFICIENCY OF WATER USE IN CRANBERRIES. Water Resources Research Center Completion Report, January 31, 1968.

Other Publications

Norton, John S., DEVELOPMENT OF METHODS FOR INCREASING THE EFFICIENCY OF WATER USE IN CRANBERRIES. Proceedings of the Water Resources Research Symposium, University of Massachusetts. Water Resources Research Publication No. 3. June, 1967.

A-006 -- "Relation of Sediment Load to Hydrological Characteristics of Connecticut River Between Northfield and Springfield, Massachusetts" Miles O. Hayes

Completion Report

Hayes, Miles O. RELATION OF SEDIMENT LOAD TO HYDROLOGICAL CHARACTERISTICS OF CONNECTICUT RIVER BETWEEN NORTHFIELD AND SPRINGFIELD, MASSACHUSETTS Water Resources Research Center Completion Report, January, 1967.

A-007 -- "The Ecological Significance of Cellulolytic Bacteria in Quabbin Reservoir" John T. Reynolds, Ernest A. Snow, Jr., Warren Litsky

Termination Report

Reynolds, John T. THE ECOLOGICAL SIGNIFICANCE OF CELLULOLYTIC BACTERIA IN QUABBIN RESERVOIR Water Resources Research Center Termination Report, January, 1968.

A-008 -- "Adsorption of Pesticides on Earth Materials" John H. Baker

Completion Report

Baker, John H. ADSORPTION OF PESTICIDES ON EARTH MATERIALS Water Resources Research Center Completion Report, August, 1968.

Masters and Doctoral Theses

Shin, Young Oh. ADSORPTION OF ATRAZINE ON REPRESENTATIVE MASSACHUSETTS SOILS. Thesis -- M.S. September, 1967. 47 pages.

A-009 -- "Closed Systems for Animal Sewage Treatment" Joseph T. Clayton

Completion Report

Clayton, J. T. CLOSED SYSTEMS FOR ANIMAL SEWAGE TREATMENT Water Resources Research Center, University of Massachusetts Publication (in progress)

Journal Articles

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Bernard B. Berger, Director, Water Resources Research Center

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During fiscal 1971, the University of Massachusetts Press marked its sixth year of publication, with the release of the following titles: Horse, Bird and Man: The Origins of Greek Painting, by J. L. Benson; Experience and Theory, edited by Lawrence Foster and J. W. Swanson; And Sandpipers She Said, by Donald Junkins; Some Deaths in the Delta, poetry by Rosellen Brown; The Symposium of Plato, translated by Suzy Q Groden with an introduction by John Brentlinger and illustrations by Leonard Baskin; The Growing Tree, by B. F. Wilson; A Drunk Man Looks at the Thistle, by Hugh MacDiarmid, edited by John C. Weston; Military Government Journal: Normandy to Berlin, by John J. Maginnis, edited by Robert A. Hart; The Trouble with Francis: An Autobiography by Robert Francis; The American Shakers, by Henri Desroche, translated by John Savacool; The Politics of Defeat, by Robert J. Huckshorn and Robert C. Spencer.

The year also was marked by the initiation of a major publishing project, the publication of the previously unpublished papers of W. E. B. Du Bois. Dr. Du Bois, who died in 1963 at the age of ninety-five, was the chief founder of the National Association for the Advancement of Colored People and of the Pan-African Movement. He was a distinguished scholar in history, sociology and anthropology, the author of novels, plays, poems, and the founder and editor of The Crisis. He was the author of numerous books, among them The Souls of Black Folk (1903) and Black Reconstruction (1935). Contractual arrangements for publication of the papers were made during Mrs. Du Bois's recent tour of the United States. The papers will be under the editorship of Dr. Herbert Aptheker, custodian of the Du Bois papers and the editor of Autobiography of W. E. B. Du Bois. Professor Sidney Kaplan of the University of Massachusetts and Mr. Ernest Kaiser, of the staff of the Schomburg Collection of Negro Literature and History of the New York Public Library, will serve as consultants. The papers will be published in several volumes over a five-year period.

In addition to approving publication of the unpublished papers of W. E. B. Du Bois, during the year the Press Committee approved the following works: Towards a Theory of Distributive Justice, by Norman E. Bowie; The Prince and the Genie: A Study of the Influence of Rimbaud on Claudel, by John MacCombie; Achievements of the Left Hand: Essays on the Prose of John Milton, edited by John T. Shawcross and Michael Lieb; De la grammatologie, by Jacques Derrida, translated by Gayatri Chakravorty Spivak; The Trouble with Francis: An Autobiography by Robert Francis; James Agee: A Study of Artistic Consciousness, by Alfred Barson; The Voice of the Folk: Folklore and American Literary Theory, by Gene Bluestein; Beowulf, translated by Burton Raffel with illustrations by Leonard Baskin; Essays on Typology, edited by Sacvan Bercovitch; an anthology of poetry by women, edited by Florence Howe and Ellen Bass; The Lycis and Charmides of Plato, translated by Suzy Q Groden, with an introduction by John Brentlinger; translation of La Caracterizacion del Protagonista Negro en La Novela Cubana, by Pedro Barreda; Letter to an Arab Friend, by André Chouraqui; Lyric Resonance: Glosses of Some Poems by Yeats, Frost, Crane, Cummings and Others, by David Clark; The Dartmouth College Case, by Francis N. Stites;

Von der Wahrheit, by Karl Jaspers, translated by Leonard and Edith Ehrlich; The Flora of Massachusetts, by Harry Ahles, edited by Vernon Ahmadjian (the last two subject to receipt of subsidies). The Poetry Board approved publication of Crying in the Cheap Seats, by Bill Tremblay. With the Committee's approval, the Press became the distributor of Wendell Willkie: Fighter for Freedom, by Ellsworth Barnard.

During 1971 the following members of the faculty and administration served on the Press Committee: Mortimer H. Appley, Kenneth Walker, Arthur Gentile, Leone Stein, Alexander Chajes, Donald Fairbairn, Sumner Greenfield, Charles Page, Howard Quint, Jules Chametzky, Ben Seligman, John Weston. William C. Havard served as chairman until his acceptance of a Deanship at Virginia Polytechnic Institute. In March, Charles Page was appointed chairman. Members of the Poetry Board included David Clark (chairman), Paul Wright, Rosellen Brown, Robert Bagg, Ben L. Reid, and Bill Tremblay.

During the year two Press publications received design and production awards. The Symposium of Plato was selected for the 1971 AAUP Book Show. A Drunk Man Looks at the Thistle was a Top Honor Book in the Chicago Book Clinic Exhibition and received an award for typographic excellence from the New York Type Directors Club. Both works were designed and produced by Richard Hendel, who will be on leave from the Press during the fall to teach at the London College of Printing.

Reviews of Press publications, which have always been predominantly favorable, multiplied noticeably during 1971. Only a few can be noted here:

Some Deaths in the Delta, by Rosellen Brown

> "Her poems are an event, and the work and love that went into them a form of action"--The New Republic.

Cuba: The Making of a Revolution, by Ramon Eduardo Ruiz

> "...a most worthwhile addition to the literature of the revolution"--International Journal.

The Growing Tree, by B. F. Wilson

> "Fascinating account of the interplay of processes involved in the growth of a tree along with a review of the tree's distinguishing structural traits"--Current Books for Academic Libraries.

Landscapes, by J. B. Jackson, edited by Ervin W. Zube

> "It is a refreshing and enlightening piece of literature, written most articulately for anyone interested in horticulture or American history and sociology"--Horticulture.

Racial Thought in America: From the Puritans to Abraham Lincoln, by Louis Ruchames

"Professor Ruchames has filled a void perhaps better than anything yet published by bringing together the thoughts of a great number of leaders in early America... an excellent research tool"--Social Science Quarterly.

Race Relations in Virginia and Miscegenation in the South: 1776-1860 by James Hugo Johnston

"The book is a 'must read' if one is interested in trying to get a better glimpse into still another facet of the American dilemma, racial misunderstanding and difficulties encounted by us all as we try to resolve this massive issue"--Cleveland Plain Dealer.

And Sandpipers She Said, by Donald Junkins

"...a real book....One admires, and is moved by, the strength and gentleness and intelligence of Junkins' sensibility"--Boston Sunday Herald.

Culture and Change in India: The Barpali Experiment, by Thomas M. Fraser

"recommended reading for students of contemporary India as well as for social scientists anddevelopment administrators interested in social change at the local level"--Journal of Asian Studies.

The Defense of Gracchus Babeuf Before the High Court of Vendome, edited and translated by John Anthony Scott, with an essay by Herbert Marcuse and illustrations by Thomas Cornell

"A beautifully prepared volume which features an excellent English translations with wonderful illustrations and a commentary by Herbert Marcuse...all deserve high praise for their contributions"--Science and Society.

Charles S. Peirce on Norms and Ideals, by Vincent G. Potter, S.J.

"a thoughtful and very subtle study of Peirce's thought"--Man and World.

The Dialectics of Creation, by Michael Lieb

"an intelligent examination of how the structure, movement and verbal texture of the poem are founded in the struggle of what Blake and Yeats would call contraries....Professor Lieb's book is well worth reading even for those not prepared to enter into psychic coition with it"--The Times Literary Supplement.

Black and White in American Culture: An Anthology from the Massachusetts Review, edited by Jules Chametzky and Sidney Kaplan

"It is an exciting book, with a higher degree of relevance to an America on the eve of a second Civil War than almost any book of its kind....One will have to look hard to find a better collection of writing on blacks and whites in our culture"--The New York Times Sunday Book Review.

Ely: Too Black, Too White, by Ely Green, edited by Arthur Ben and Elizabeth N. Chitty

"As a narrative alone it is good literature--filled with its problems, heroes, and villains. Better still, however, it is a personal document that gives us added understanding of what it meant to be neither white nor black in a society whose benevolence ended with paternalism"--The Journal of Southern History.

Horse, Bird and Man: The Origins of Greek Painting, by J. L. Benson

"It is an imposing case which needed making, and it is quite time that the pendulum should swing in this direction"--Times Literary Supplement.

As the character of the reviews of University of Massachusetts Press books indicates, attracting good manuscripts is not a problem. What has become a problem is the volume of manuscripts which the Press must consider each year. As the reputation of the Press has grown, that volume has reached all but overwhelming proportions. Following preliminary reviews by the Director, Leone Stein, and the Editor, Paul Wright, manuscripts are often read by members of the University of Massachusetts faculty. Their great assistance, without remuneration other than in the form of complimentary copies of Press publications, is much appreciated. Following their recommendations, if the manuscript is promising it is given to one or more off-campus readers, before presentation of reports to the Press Committee, which governs the imprint. The Committee's concern to publish fine works has been a major contributor to the outstanding reputation of the Press.

Operating under a mandate to publish the best possible scholarship, the Press has developed a list which has been widely and well reviewed and which reaches an average market of approximately 3,000 copies per title. It remains in large part a subsidized publishing program, supported by the University, as is typical of scholarly publishing. In our view, to increase the sales income over the next years, in anticipation that budgets will be tight, will require widening the concept of what is appropriate to university press

publishing, to include a larger percentage of titles that show promise of covering their own costs. But traditionally university press publishing depends substantially on subsidies. In addition to support from its parent institution, a university press seeks specific title support from individuals, foundations, or governments to make up the deficit. Every effort is being made to obtain such support. Outside subsidies have assisted publication of The American Shakers and Some Deaths in the Delta, during the year, and will support Patriotism, Inc., Tales by Paul van Ostaijen, due for publication this summer. As noted above (regrettably) publication of two recently approved titles is contingent upon such support.

Net sales for fiscal 1971--final figures will be available in July--are anticipated at $80,000; a thirty-six percent increase over the previous year. Sales for next year are projected at $100,000 or more. The inventory as of March 1971 was evaluated at $107,000, with a net worth of approximately $250,000. The sales department, which has operated for six years under the severest budgetary limitations, nonetheless distributed, in 1971 alone, well over 30,000 copies of seasonal catalogs, 35,000 mailing pieces, and 80,000 news releases, under the supervision of Ann Reinke, Sales Manager, and Patricia Reilly, Promotion Manager. During the year, the Press took part in the New England Book Festival, co-sponsored a Poetry reading at the University of Massachusetts, and participated in numerous exhibits for professional associations. The services of a second commission salesman were added, and negotiations for a midwest representative initiated. A slightly increased budget projected for 1972 will permit some extension in advertising and promotion, in a further campaign to increase sales income.

The sales department, which must depend upon part-time student help (excellent but seasonal), and the editorial department, which must use free-lance copy editors in lieu of a much needed full-time editorial assistant, are especially overworked. New data processing and warehouse and distribution services, reviewed by William Singleton, the Press accountant, were acquired in May, providing some relief to the staff. Present members include: Leone Stein, Paul M. Wright, Richard Hendel, Ann Reinke, Patricia Reilly, William Singleton, Beverly Ann Rogers, Donna Wood and Lorraine Plant.

Fourteen titles are scheduled for publication this year. Should inflation continue and University support level off, the effect on the Press publishing program would be directly reflected in the title output. Five years ago, in the midst of an expanding economy, it was projected that within a decade the Press would be publishing 20 to 25 titles per annum, as a medium-sized univ ersity publishing house, with appropriate subsidy. Should such development prove unlikely, the Press could stabilize at a level of 12 to 14 titles a year. Such a limitation would require holding the line in the face of vastly increased pressure to publish more.

This report has emphasized problems faced by the Press rather than the accomplishments of a dedicated staff and the generous support of many members of the faculty, other scholars, and the administration. We are grateful for this dedication and support.

Charles Page, Chairman of the Committee

Leone Stein, Director of the Press

POLYMER SCIENCE AND ENGINEERING
ADVANCED DEGREE PROGRAM AND
ACTIVITIES OF THE POLYMER RESEARCH INSTITUTE

ANNUAL REPORT

6/1/70 - 5/30/71

FACULTY IN POLYMER SCIENCE AND ENGINEERING

COLLEGE OF ARTS AND SCIENCES	GRADUATE SCHOOL ADMINISTRATION	SCHOOL OF ENGINEERING
Department of Chemistry	Polymer Science and Engineering Program	Department of Chemical Engineering
Commonwealth Professor Richard S. Stein and Polymer Research Institute Director	Professor Roger S. Porter Head, PSE	Professor Robert W. Lenz Associate Head, PSE
Associate Professor William J. MacKnight	Professor Frank E. Karasz	Associate Professor Robert L. Laurence
Professor James C. W. Chien	Adjunct Associate Professor Seymour Newman	Professor Stanley Middleman
	Professor Fraser P. Price	
	Professor Otto Vogl	

Polymer Science and Engineering is a graduate degree program. Five professors are exclusively in PSE. Six additional members of the PSE faculty report through other departments. The Polymer Research Institute, established in 1961, is a separate University component which serves as the research coordination, communication, and funding complement to the PSE educational program.

GRADUATE STUDENTS IN POLYMER SCIENCE AND ENGINEERING

	Fall 1966	Fall 1967	Fall 1968	Fall 1969	Fall 1970
PSE Majors	2	16	29	36	42
Others in Residence*	10	7	8	10	15
Part-Time PSE Majors	7	12	16	18	18

*Most of the students outside PSE come from the Department of Chemistry and the School of Engineering. Over half this group is under the thesis supervision of PSE faculty.

ADVANCED DEGREES CONFERRED IN POLYMER SCIENCE AND ENGINEERING

1968	1969	1970	1971
Master's Degrees	Master's Degrees	Master's Degrees	Master's Degrees
A. Torgalkar*	W. Chu	F. Emerson	D. Alberghini
S. Go	T. Hashimoto	A. Fritzsche	C. Beatty
M. Yang	R. Penwell	S. Fang	T. Blomstrom
W. Robinson	W. Prest	P. Kapadia	C. Chou
W. Taggert	J. Southern	B. Mentro	G. Cigal
	G. Wilkes	R. Ulrich	N. Demetriadis
	C. Wu	J. Wang	F. Khambatta
			R. McKnight
	Ph.D.	Ph.D.	C. Ong
			D. Yoon
	T. Kajiyama	G. Davis	
			Ph.D.
			E. Chang
			F. Emerson
			T. Hashimoto
			L. Mango
			L. McKenna
			R. Penwell
			J. Southern
			A. Tanaka
			C. Wu

*Master's with thesis.

Only highly qualified students are being enrolled. Of those accepted by PSE, about 70% actually enroll. This percent acceptance is twice the average of Chemistry, Engineering, and the University as a whole.

ACTIVITIES

A complete curriculum revision has been completed for courses in Polymer Science and Engineering. The changes represent the first major alteration in course structure since the initiation of PSE in 1966. Professor Robert Lenz is in charge of curriculum revision.

The PSE faculty hosted on campus in the summer of 1970 a three-day course on the subject of gel permeation chromatography. The course was sponsored by the Plastics Institute of America.

The PSE Seminar Program is among the most active on campus - over 50 speakers per year, about 10 from outside the U.S., see attached list. Seminar notices are mailed to over 200. The Seminar Program has been arranged by Professor Otto Vogl for the academic year 1970-1971.

An entirely new brochure on the Polymer Science and Engineering Program has been prepared, proofed, printed, and distributed to over 4,000 polymer scientists around the world and to 250 U.S. department heads for departments of chemistry and chemical engineering.

PSE faculty and students participated in a technical program and meeting of the Advisory Committee of the Polymer Research Institute at the University of Massachusetts, June, 1970, and May, 1971.

Professor Price is on the Graduate Council. Professor Karasz is on the Graduate Research Center Library Committee. Professor Porter is on a committee for the Analytical Services Laboratory.

Abstracts were prepared on the PSE Program for inclusion in (1) Peterson's Guide for Graduate Students in Engineering and in (2) The Graduate School Directory for Departments of Chemistry and Chemical Engineering.

A course proposal was written, submitted to NSF, and approved with a budget of $35,000 for sponsorship of a Summer Institute to instruct college teachers in chemistry and engineering in the field of polymer science.

Several nominations were prepared during the year for national and international awards in chemistry, engineering, and in polymers.

FUTURE PLANS AND NEEDS

Combined improved machine shop, photographic and drafting services are important to PSE and to other University graduate programs. For PSE, space is also a crucial and serious limitation on development even with Tower A assignments. We wish to realize, in the next years, the potential that is yet available to us. The record indicates that we can continue to add easily both quality faculty and students. We need to add young staff particularly. Substantial funding is also available. The PSE faculty averages about four major research grants per man, possibly a high for the campus.

Polymer Science and Engineering continues to mature as one of the top centers for polymer studies in the world. This is an area where U.S. education lags far behind research and personnel demands. Out students are strongly sought by the plastics industry which continues to grow several times faster than the national economy. Space has been arranged for moderate growth of PSE. Floors 7 and 8 of Tower A of the Graduate Research Center are for polymer research. Long-range plans call for several laboratories in a new building devoted principally to Chemical Engineering.

PSE and PRI wish to remain separate and distinct programs of the University reporting to the Graduate School. The Polymer Science and Engineering Program wishes to continue its development as a separate, graduate-level University department.

A REPORT OF THE ACTIVITIES OF THE POLYMER RESEARCH INSTITUTE

June 1, 1970 - May 31, 1971

INTRODUCTION

The role of the Polymer Research Institute (PRI) is to coordinate the research activities of the ten staff members and approximately fifty graduate students, post-doctoral fellows and visiting scientists working in polymer-involved activities at the University of Massachusetts. These activities are principally related to the educational programs of the Polymer Science and Engineering Program (PSE), the Chemistry Department and the Chemical Engineering Department. The educational activities of the PSE Program will be described in its report.

During the year, initial efforts were made to engage in cooperative programs with the Mechanical and Aerospace Engineering Department. These activities involved cooperation in teaching a course in X-Ray Diffraction between Professor Carl Nelson and Professor Richard Stein and cooperative research between Professor Frank Karasz and Professor Nelson. Professor Karasz has also been involved with cooperative research with Professor Norman Ford of the Physics Department. It is hoped that such cooperative research efforts will naturally develop. Possibilities of coordinating the development of a Materials Science Program with the Polymer Science Program will be explored at this year's meeting of the PRI Advisory Board.

There have been no staff additions during the past year. The PRI concurs with the desire of the PSE Program to add a theoretician to its staff. While an excellent candidate for such a position was nominated, a position was not forthcoming.

No major changes in space or facilities occurred during the year. Both the PRI and the PSE Program are extremely cramped in their present quarters. Facilities are being utilized in the Chemistry Department, the Chemical Engineering Department, the Mechanical and Aerospace Engineering Department, Draper Hall, and Draper Annex. The occupation of space in the Graduate Research Center (GRC) is anxiously anticipated during the next year.

The hiring of two machinests in the Chemistry Department machine shop, which is available to the PRI and PSE Program, has been a great aid in the fabrication of equipment. Members of the PRI staff have been of great assistance in acquiring surplus government equipment to furnish this shop and the future expanded shop which will become available when space is vacated by the move into the GRC. Some 30 machine tools valued at over $100,000 have been acquired in this manner.

The PRI continues to enjoy the use of the research services provided by the Photo Center, the Glassblowing Shop, the Analytical Laboratory and the Computing Center. We particularly urge that means be found for continuing the high-level operation of the Analytical Laboratory which has been of significant value to our staff and students.

Major equipment acquisitions during the year include the installation of a rotating anode x-ray generator, a low-angle x-ray scattering apparatus, and a microcalorimeter. The acquisition of additional major equipment to be obtained with funds made available in connection with the GRC is anticipated.

FINANCES

The operation of the PRI is made possible through two sources of funds:

(1) Direct grants (principally industrial) to the PRI.

(2) A fraction (25%) of indirect costs on grants and contracts to staff members of PRI.

Of the above, (1) is the largest amounting to approximately $65,000, almost the same as during last year. The amount available through (2) has increased from approximately $10,000 last year to $15,000 this year. This increase has primarily resulted from an increase in the number of grants and contracts to staff members.

Thus, even with the present recession, the funding of PRI activities remains healthy. We are in a stronger position than many other institutes in that, while no direct support of the operation of PRI comes from the Commonwealth, no salaries of professional staff members is paid from Institute "soft" money. All professional staff are full-time University faculty whose academic year salaries are paid by the Commonwealth. In most cases, summer salary payment to professional staff comes from their grants and contracts, but, in some cases, assistance is made from PRI funds.

Income from PRI is principally used to finance fellowships for students.. Some 16 students were aided with PRI support. Other uses for PRI funds have been in assisting in the provision of secretarial and shop services, with the acquisition of limited amounts of research equipment and supplies and with the seminar program which has brought 40 outstanding speakers, as summarized later in the report. As University travel funds have not been adequate, PRI funds have assisted staff and students to attend professional meetings.

The income to PRI is maintained in a trust fund account by the University for disbursement for the above purposes.

GRANTS-IN-AID

The number of grants-in-aid and their amounts have remained about the same during the past year. This level of support has been maintained through the active and effective work of Professor Karasz who has coordinated this effort. He has been assisted by the

vigorous efforts of the PRI and PSE staff who have developed close contacts with industry by industrial visits and seminar presentations. (These activities will be detailed in the PSE report.) The invitation of selected industrial visitors to the annual PRI Advisory Board meeting also serves to strengthen interactions.

The industrial grants-in-aid are relatively small, averaging about $4,000. In most cases, the use of these funds is not restricted and in all cases research results are publishable and usable for graduate theses. The PRI generally discourages contracts for classified, restricted or specific research. In most cases the grant may be used to support any of the staff of the program.

Organizations providing grants-in-aid during the past year are:

1. Celanese
2. E. I. duPont deNemours
3. Esso
4. Ford
5. Gillette
6. B. F. Goodrich
7. Hercules (Karasz)
8. Hooker
9. International Business Machines
10. Monsanto
11. Owens-Illinois
12. Plastics Institute of America
13. Rubber Chemistry Division (American Chemical Society)
14. Tennessee-Eastman
15. Union Carbide
16. Xerox

RESEARCH GRANTS AND CONTRACTS

Title of Research	Agency	Duration of Grant	Funds Per Year
James C. W. Chien			
Studies on the Surface Structures of Catalysts and Catalyst Supports and On the Autoxidation of Hydrocarbon and Hydrocarbon Polymers	Petroleum Research Fund, American Chemical Society	8/70 to 8/72	$10,000
A Mechanistic and Synthetic Study of Nitrogen Fixation	National Science Foundation	9/70 to 9/72	12,000
A Physical Chemical Study of Collegin Structure	National Institutes of Health	5/71 to 5/74	13,875
Autoxidation of Polymers	National Science Foundation	5/71 to 5/74	18,000
Frank E. Karasz			
Conformation of Polypeptides	National Science Foundation	Sept. '68 to July '70	$15,000
Molecular Structure and Thermodynamic Properties	Air Force Office of Scientific Research	11/67 to 10/70	25,000
Thermodynamic Properties	National Science Foundation	9/69 to 9/71	23,000
Homodyne Spectroscopy (Co-principal Investigator)	National Science Foundation	8/70 to 8/71	18,000
Effect of Pressure on Polymers	Petroleum Research Fund	9/69 to 9/72	7,667
Post-Doctoral Support	National Institutes of Health, Biomedical Facilities Support Grant	yearly	4,000
William J. MacKnight			
The Role of Interchain Forces in Rubber Elasticity	National Science Foundation	6/70 to 9/72	14,550
Chemical Stress Relaxation	Petroleum Research Fund American Chemical Society	6/67 to 9/70	8,000

Title of Research	Agency	Duration of Grant	Funds Per Year
Robert W. Lenz			
Reaction Induced Crystallization of Polymers	National Science Foundation	10/68 to 1/72	$4,160
Preparation and Evaluation of New Polymers; and New Composite Materials Via Direct Polymerization on or in Catalyst Carrying Substrates	Project Themis, Department of Defense	9/67 to 8/72	2,500
Studies on the Polymerization of Benzyl Chloride	Esso Research and Engineering Company	6/69 to 6/72	1,500
Fraser P. Price			
Kinetics of Transformations in Mesophases	Department of Health, Education and Welfare	10/69 to 10/71	$24,738
Crystallization of Polymers Under Extreme Conditions	National Science Foundation	6/71 to 6/74	23,600 (this year)
Richard S. Stein			
Research on the Structure of Synthetic High Polymers	Office of Naval Research	6/54 to 6/72	$25,000
The Relationship between Crystal Morphology and Mechanical Properties	Petroleum Research Fund American Chemical Society	9/66 to 9/71	8,000
Dynamic Infrared and Ultraviolet Dichroism of Polymer Solids	National Science Foundation	6/68 to 6/71	14,300
Light Scattering and Orientation in Mesophases	Department of Health, Education and Welfare	3/68 to c/72	15,000
Optical and X-Ray Studies of Polymer Relaxation	National Science Foundation	6/71 to 7/72	25,100

Title of Research	Agency	Duration (years)	Funds Per year
Robert L. Laurence			
Studies of Mixing in Polymerization Reactions	Kenics Corporation	yearly	$ 4,300
Reactor Studies with Immobilized Bienzyme Catalysts (co-principal investigator)	National Science Foundation	6/71 to 6/72	44,000
Roger S. Porter			
Viscosity Changes with Shear and Composition near Transitions in Polymer-Solvent Systems	Paint Research Institute	1/70 to 1/71	$ 6,000
The Viscosity of Partially Crystalline Polymers	National Science Foundation	8/70 to 7/72	34,200
Shear-Induced Changes in Polymer Molecular Weight Distribution	U.S. Army-Durham	6/71 to	10,940
Column Methods for Separation of Large Molecules	National Science Foundation	6/69 to 6/71	20,500

STUDENTS SUPERVISED

Student	Category[+]	Support[±]	Research Topic	Supervisor
Y. Akana	M	C	Optical Studies of Crystallization and Deformation of Trans 1,4 Polybutadiene	Stein
D. Alberghini	P	PRI	Mixing in Polymerization Reactors	Laurence
A. Allegrezza	(P)	R	Effect of Molecular Weight Distribution of Lactone Polymers	Lenz
X. Baba	M	C	Optical Studies of Crystallization and Deformation of Ethylene-Propylene Copolymers	Stein
C. Beatty	P	R	Thermodynamic Properties of Poly-4-Methyl-Pentene Polymorphs	Karasz
D. Bigg	(P)	U	Mixing in Polymers	Middleman
J. Brown	(M)	O	Kinetics of Reversible Polycondensation	Laurence
R. Calabrese	(P)	R	Atmospheric Dispersion in Particulates	Middleman
C. Cassidy	M	O	Stereochemistry of Vinyl Ether Polymerization	Lenz
A. Chattopadhyay	P	PRI	Heterogeneous Nucleation of Polymer Crystallization	Newman
S. P. Chang*	P	R	The Strain Dependence of the Orientation Mechanism of Polyethylene	Stein
A. Chang	(P)	TA		Vogl
S. Chou	P	PRI,R	Optical Studies of Rubber Deformation	Stein
S. Chu	P	TA,R	Rheo-Optical Studies of Polyethylene and Polyurethanes	Stein

Student	Category+	Support±	Research Topic	Supervisor
. Cigal	M	PRI	Diffusion in Polymer Solutions	Middleman
. Copas	(P)	R	Membrane Separation of Protein Solutions	Middleman
. Demetriadis	M	O	(Master's Without Thesis)	Lenz
. Denton	(P)	U	Optimization of Batch Polymerization Reactors	Laurence
. Dever	P	PRI,R	Synthesis and Properties of Stereo-regular Poly-α-chloroacylate Esters	Karasz, Lenz, MacKnight
. Dickinson	PD	R	Structure of Hemoproteins	Chien
. Dubin	PD	R	Conformational Transitions in Biological Polymers	Karasz
. Dudgeon	(P)	TA		Vogl
. Emerson*	P	R	Strain Relaxation of Polyethylene-Phosphonic Acid Copolymers	MacKnight
. Fragala*	M	PRI	(Master's Without Thesis)	
. Fritzsche	P	R	Crystallization Transformation Kinetics Under Shear	Price
. Garbler	PD	R	Rayleigh Light Scattering	Karasz
. Go	P	R	Reaction-Induced Crystallization of Poly-(1,4-Cyclohexylenedimethylene Terephthalate)	Lenz
. Goetze	M	R	High-Shear Viscometry; Shear Stability of Polymers Using GPC	Porter
. Griffen	M	R	Phase Studies on Liquid Crystals	Porter
. Hashimoto	P,PD	R	Dynamic Light Scattering from Crystalline Polymers	Stein

Student	Category[+]	Support[±]	Research Topic	Supervisor
W. Herring	(M)	U	Development of Immobilized Enzyme Catalysts	Laurence
J. Illinger	P	C	Polyurethanes	Karasz
F. Isackson	P	R	Computer Simulation of Crystallization of Single Polymer Molecules	Price
S. Jabarin	P	PRI	Light Scattering and Microscopy of Liquid Crystals	Stein
A. Kagemoto*	PD	R	Conformational Transitions of Polypeptides	Karasz
J. Kao	PD	R	Low-Angle X-Ray Scattering Studies	Stein, MacKnight
P. Kapadia*	M	R	Effect of Polymer-Solvent Interaction on Normal Stresses in Solution	Middleman
F. Khambatta	P	R	Effect of Pressure on Glass Transition Temperature of Polymer-Diluent Mixtures	Karasz
D. Klempner	PD	R	X-Ray Diffraction of Crystalline Polymers Under High Pressure	Karasz
G. Kleinheins	PD	F	Dielectric Relaxation of Polyethylene Derivatives	Stein
J. Kuo	P	R	Linear Polybenzyl	Lenz
T. Lin	M	R	Autooxidation of Polybutene-1	Chien
. Long	(M)	U	Evaluating Membranes for Water Purification	Lenz
. Mangaraj*	PD	R	Effect of Pressure on Melting Behavior of Polymers	Karasz
. Mango	P	U,R	Kinetics and Mechanism of Anionic Polymerization of 1,3-Cyclohexadiene	Lenz

Student	Category[+]	Support[±]	Research Topic	Supervisor
L. Manrique	M	PRI	High Shear Viscometry	Porter
L. McKenna*	P	C,R	Physical and Mechanical Properties of Ethylene-Methacrylic Acid Copolymers and Salts	MacKnight
R. McKnight	P	U,PRI	Conformational Transitions of Polypeptides	Karasz
A. Misra	P	R	Optical Studies of the Crystallization and Deformation of Polyethylene Terephthalate	Stein
R. Moen	P	PRI	Electron Paramagnetic Resonance Study of Enzyme Structures	Chien
T. Niikuni	M	C	Special Polyethylene Morphologies Produced by Shear	Porter
T. Oda	PD	R	Dynamic X-Ray Studies of Polyethylene	Stein
C. Ong	P	U	Crystallization in Polymer Component Systems	Price
B. Oster	P	O	Mechanism of Olefin-Sulfur Dioxide Copolymerization	Lenz
R. Penwell*	P	U,PRI	Effect of Pressure and Shear on Capillary Flow of Polymer Melts	Porter
G. Phillips	(M)	R	Turbulent Dispersion Properties in a Wind Tunnel	Middleman
P. Phillips*	PD	R	Dielectric and Mechanical Studies of Polyethylene Derivatives	Stein
C. Picot*	PD	R	Theoretical and Experimental Studies of Light Scattering from Crystalline Polymers	Stein
J. Pikarsky	(P)	U	Evaluating Derivatives of Polyolefins for Water Purification Membranes	Lenz
E. Pitera*	(M)	R	Hydrodynamics of Membrane Desalination	Middleman
W. Prest	P	PRI	Influence of Molecular Weight Distribution on Polymer Rheology	Porter
R. Prud'homme	P	TA	Static and Dynamic Light Scattering from Polyethylene and Its Derivatives	Stein

Student	Category+	Support±	Research Topic	Supervisor
P. Riley	(P)	TA	Hydrodynamic Stability of Oscillatory Flows	Laurence
M. Schlanger*	(M)	U	Diffusion Coefficients in Polymers by Bubble Dissolution Techniques	Laurence
S. Schneller	(P)	R	Model Compounds for Nitrogenase	Chien
C. Sherwood	P	PRI	Mechanochemistry of Polymers	Porter
J. Southern*	P	U,R	Morphologies Produced by Pressure and Shear Near Polymer Melting Points	Porter
D. Sukanek	(P)	U	Melt Fracture and Viscous Heating	Laurence
J. Sutherland	P	C	Stereoregular Polymerization of α-Methylstyrene and Related Monomers	Lenz
K. Tada	PD	C	Optically-Active Polymers	Vogl
W. Taggert	P	C	Morphology of Ionomers	MacKnight
A. Tanaka*	P	R	Rheo-Optical Studies of the Temperature Dependence of Polyethylene Deformation	Stein
A. Taylor	(P)	U	Turbulent Dispersion in Drag Reducing Fluids	Middleman
R. Tetreault	P	C,R	Relaxation Studies of Ethylene-Vinyl Acetate Copolymers	MacKnight Porter
J. Tkacik	P	PRI	Properties of Polyblends	MacKnight
T. Tung	(P)	TA	Diffusion Broadening in Gel Permeation Chromatography	Laurence
Y. Uemura	V	C	Dynamic Infrared Dichroism	Stein
R. Ulrich	P	U,R	Isothermal Spherulite and Single Crystal Growth Under Shear Measurements	Price

Student	Category[+]	Support[±]	Research Topic	Supervisor
N. Vaidyanath	(M)	TA		Vogl
J. Wang	P	R	Rheology of Poly-1-Olefin Series Up to Poly-1-Octadecene	Porter
N. Weeks	P	PRI,R	Formation and Analysis of Special Polyethylene Morphologies	Porter
J. Wendorff	PD	R	Kinetics of Mesophase Transitions	Price
L. Whitlock	PD	R	Fundamentals and Applications of Gel Permeation Chromatography	Porter
G. Wilusz	P	R	Thermodynamic Studies of Glass Transition Phenomena	Karasz
C. Wu	P	PRI	Configurational Studies of 3-Methylenecyclobutene Polymerization	Lenz
M. Yang	P	R	Spectroscopic Studies of Hydrogen Bonding in Polyurethanes	MacKnight
D. Yoon	P	U	Theories of Light Scattering from Crystalline Polymers	Stein
P. Wang	(P)	R	Kinetics of Hydro-Oxidation of Hydrocarbons	Chien

[+]P = Ph.D. Candidate
M = M.S. Candidate
PD = Post-Doctoral Fellow
V = Visiting Scientist
( ) = Students in other departments

±PRI = PRI Grant Support
C = Supported by recipient's company
TA = Teaching assistantship
R = Research fellowship based on grant or contract to staff member
F = Fellowship or grant directly to student
O = No support received
U = University support

*Work completed during this year

SEMINAR PROGRAM

The active seminar program has been led by Professor Vogl. Outside speakers contributing to this program are listed. In most cases, speakers from industry were supported by their companies while those from academic institutions were paid an honorarium from PRI trust funds or the PSE budget.

Speaker	Topic	Date
Dr. Robert Schulken, Jr. Tennessee Eastman Company Kingsport, Tennessee	Turbidimetric Titration of Polymer Solutions	6/15/70
Professor Victor Bloomfield University of Minnesota Minneapolis, Minnesota	Hydrodynamic Properties of Biological Macromolecules	6/22/70
Dr. I. Yannas Massachusetts Institute of Technology Cambridge, Massachusetts	Collagen Physics	6/26/70
Dr. Chris Macosko Princeton University Princeton, New Jersey	Polymer Studies Using the Orthogonal Viscometer	6/26/70
Dr. H. E. Bair Bell Telephone Laboratories Murray Hill, New Jersey	Thermoquantitative Analysis of Polymers	6/30/70
Dr. B. D. Marsh Union Carbide Corporation Bound Brook, New Jersey	Rheological Properties of Block Copolymers	7/10/70
Professor T. Kagiya Kyoto University Kyoto, Japan	An Energetic Study on the Catalytic Activity in Ionic Polymerizations	7/13/70
Dr. Paul Rempp Center for Macromolecular Research Strasbourg, France	Kinetics of Anionic Polymerization in the Presence of Small Quantities of Polar Additives	7/17/70
Dr. Colin Price University of Manchester Manchester, England	Characterization and Properties of Some Elastomeric Block Copolymers	7/27/70
Professor S. Onogi Kyoto University Kyoto, Japan	Rheo-Optical Properties of Polyethylene	7/29/70
	Rheological Properties of Narrow Distribution Polystyrene Melts	8/5/70

Speaker	Topic	Date
Dr. G. Ebert University of Marburg Marburg, Germany	Studies on Hydrophobic and Hydrophilic Interactions in Protein Fibers	7/31/70
Dr. J. J. van Aartsen AKZO Laboratories Arnhem, Holland	Light Scattering as a Tool for the Characterization of Polymeric Materials	9/18/70
Dr. H. Van Oene Ford Motor Company Dearborn, Michigan	Modes of Dispersion in Polymer/Polymer Composites	9/22/70
Dr. W. Glenz Research Triangle Institute Durham, North Carolina	Infrared Spectroscopy of Drawn Polyethylene	9/25/70
Professor C. Bamford University of Liverpool United Kingdom	Non-Ideal Polymerization	9/25/70
Professor K. Ivin University of Belfast United Kingdom	Thermodynamics and Reversibility of Addition Polymerization	9/28/70
Professor H. K. Hall University of Arizona Tucson, Arizona	Polymers Containing Small Rings	10/7/70
Dr. J. Schaefer Monsanto Company St. Louis, Missouri	High Resolution Pulsed ^{13}C-NMR Study of Polymers	10/7/70
Dr. A. Barney DuPont DeNemours Wilmington, Delaware	Fluorocarbon Elastomers	10/9/70
Professor S. Palit Calcutta India	Polymers in Non-Solvents	10/12/70
Dr. A. Kovacs Strasbourg France	Phenomena in the Solid State of Polymers	10/15/70

Speaker	Topic	Date
Professor R. Lord Massachusetts Institute of Technology Cambridge, Massachusetts	Laser Raman Spectra of Polymers	10/16/70
Dr. R. Combs Tennessee Eastman Company Kingsport, Tennessee	Relationship of Melt Flow, Glass Transition Temperature and Inherent Viscosity of Thermoplastic Polyester	10/23/70
Professor Eric Baer Case Western Reserve Univ. Cleveland, Ohio	Mechanical Behavior of Polymers at Cryogenic Temperatures Under High Pressures	10/30/70
Professor E. Fischer University of Mainz Germany	Small Angle X-ray Scattering Studies on Phase Transitions in Polymeric and Oligomeric Systems	11/4/70
Dr. W. F. Fowler Eastman Kodak Company Rochester, New York	Vinyl Polymerization with Emphasis on Reactivity Ratio Determinations	11/6/70
Dr. N. Gaylord Gaylord Research Laboratory Newark, New Jersey	Alternating Copolymerization	11/13/70
Dr. A. Langer Esso Research Laboratory	Chelated Organolithium Catalysts	11/20/70
Professor I. N. Einhorn University of Utah Salt Lake City, Utah	Chemistry of Fire Retardancy in Polymers	11/24/70
Dr. H. D. Keith Bell Laboratories Murray Hill, New Jersey	Single Crystals of Polypeptides and Polynucleotides	12/2/70
Dr. R. R. Hindersinn Hooker Chemical Company Niagara Falls, New York	Fire Retardant Technology and Mechanism of Fire Retardancies	12/4/70
Dr. C. G. Bragaw E. I. DuPont Wilmington, Delaware	Theory of Rubber Toughening of Brittle Polymers	1/15/71

Speaker	Topic	Date
Dr. J. F. Sieckhaus Olin Research Center	Boron Polymers	1/29/71
Dr. D. Massa University of California San Diego, California	Computerized Measurements of Dynamic Viscoelastic Properties of Dilute Polystyrene Solutions	2/10/71
Prof. R. H. Marchessault University of Montreal Montreal, Canada	Linear and Helical Conformations of Polyesters	2/19/71
Professor M. Szwarz Syracuse University Syracuse, New York	Electron Transfer Processes	2/24/71
Dr. M. B. Price Celanese Research Lab. Summit, New Jersey	Plastics Ecology	3/12/71
Professor G. Smets University of Louvain Belgium	Photochromism in Polymeric Systems	3/22/71
Dr. R. E. Wetton University of Loughborough United Kingdom	Molecular Motion in Substituted Polystyrene	3/25/71
Professor H. Brumberger Syracuse University Syracuse, New York	Studies on Conformation and Morphology	4/5/71
Dr. Graham Williams University of Wales United Kingdom	Dielectric Properties of Polymers	4/7/71
Dr. F. H. Winslow Bell Laboratories Murray Hill, New Jersey	Polymer Structure and Pyrolytic	4/16/71
Dr. C. Sroog E. I. DuPont Wilmington, Delaware	Polyimides	4/23/71
Dr. G. McGraw Tennessee Eastman Kingsport, Tennessee	Polarized Fluorescence for Measurement of Polymer Orientation	4/26/71
Professor G. V. Vinogradov Institute of Petrochemical Synthesis Moscow, U.S.S.R.	Polymer Rheology	4/27/71

Speaker	Topic	Date
Professor C. S. Marvel University of Arizona Tucson, Arizona	High Temperature Polymers	5/6/71
Professor A. Peterlin Camille Drey Institute Durham, North Carolina	Plastics Deformation of Crystalline Polymers	5/7/71
Dr. J. McGrath Union Carbide Bound Brook, New Jersey	Recent Advances in Organic-Silicone Block Copolymers	5/14/71

SPECIAL ACTIVITIES

1. NSF Summer Institute for Teachers in Materials Science - This course is financed by a grant from the National Science Foundation. Approximately 24 university teachers in materials science related subjects will come to Amherst from June 7 to July 16, 1971, for an intensive six-hour per day course in the applications of polymer science concepts to their materials science teaching. The course has been organized by Professor Porter and will be taught by all of the PSE-PRI staff.

2. Plastics Institute of America Courses

   (a) August, 1970 - A one-week course on "Polyethylene-Theory and Practice"

   (b) July 21-23, 1971 - A course in "Polypropylene-Theory and Practice" organized by Professor Karasz

   (c) August 25, 1971 - A short course in "Programmed Life of Plastics" organized by Professor Chien

3. International Colloquium on Synthetic Polymer Chemistry - This colloquium, organized by Professor Vogl, will occur on Saturday, July 31, 1971, to which a selected group of participants will be invited.

4. U.S.-Japan Seminar on Statistical Mechanics and Spectroscopy of Polymers, August 2-6, 1971 - This seminar has been jointly organized by Professor Stein, Professor Walter Stockmayer of Dartmouth College, and Professor S. Onogi of Kyoto University and is jointly supported by the National Science Foundation and the Japan Society for the Promotion of Science. It will bring together 10 of Japan's leading polymer physicists with 20 of their American counterparts for 5 days of intensive presentations and discussions.

MEMORANDUM August 4, 1971

From: Charles F. Cole

To: Chairman and Members of Marine Sciences Council

Subject: Marine Sciences Program; report on 1970-71 academic activities.

1. In September 1970 the Marine Sciences Program began an active year with 17 graduate students enrolled. To date two have transferred to biology programs, four have transferred to/or already were in military, one did not show, and one was a special student no longer with us, leaving nine. Three new students entered in January 1971 and three more are expected to enter in the Fall 1971, bringing the total enrollment to 15. See Table 1 for further details on students presently in the program.

2. Student Academic Progress. All students are apparently making satisfactory progress coursewise, except the following two individuals:

   a. Jeffrey Howe, Food Science, returning to college after 3 1/2 years in service had a bad Fall semester, but his grades became satisfactory during Spring 1971. He is having some difficulty arriving at a research topic but should make it.

   b. Michael Weiss, Food Science, Israeli student. Warned by Levin and Cole in February following a very low Fall semester 1970; Levin out of town when bad Spring semester grades came out. This problem may need full Committee airing after Levin and I meet with Weiss in September.

3. Thesis and/or Special Problems. I do not know what topics have been chosen by most students. I would like copies of all thesis and/or special problem outlines at your earliest convenience.

4. Comprehensive Examination. We could graduate our first class of nine as early as June 1972. Before this happens, comprehensive exams will be required as per the 20 February 1967 Memorandum on the Marine Sciences Program which is quoted as follows: "Students must pass a comprehensive written examination on the subject matter of the core curriculum." (i.e. Biological, Geological and Physical Oceanography). This examination will need to be scheduled late in April 1972 for all candidates seeking a June 1972 degree. (See 7.e. for further reasons.)

5. Preliminary or Qualifying Examinations. "Students must pass a preliminary or qualifying examination in their specialty option similar to that required of students in that department. It is suggested that

students enrolled in the Marine Sciences Program be held responsible for a less extensive range of subject matter than the departmental majors." (from the 20 February 1967 Memorandum) We need to air this in the light of our experience with students to date because it is at the heart of some serious student problems.

Of the 30 degree hours, "A minimum of 15 credit hours in the specialty option will be required. These may be taken in one or more departments, but a minimum of six credits must be taken in the student's chosen area. The development of this requirement will be governed by the student's background in his scientific specialty." (also 20 February 1967 Memorandum). Students in this program are likely to be very differently prepared from the normal departmental student. Any advisor foreseeing problems in getting good students around inappropriate departmental preliminary examinations is asked to alert us of the impending problem. Students faced with inflexible departmental requirements in excess of and inappropriate to the goals of this degree should discuss their problems early. Notification of passage should be sent to Holdsworth 317 (my office) for inclusion in students' files in program office.

6. Language examinations are required as specialty option representative dictates. Please advise of passage.

7. Marine Sciences Course Offerings.

a. Introductory Oceanography (MS 225) was taught for second time in the Fall 1970 semester to 98 students. Currently 76 (7/23) are pre-registered for Fall 1972. Lawrence Klapow now completing his Ph.D. at Scripps is due to arrive in Amherst 9 August and will teach this course in the Fall semester and Biological Oceanography in the Spring semester.

*b. Biological Oceanography (MS 201/501) was taught for the third time by Cole, Edwards and Wilce to 50 students. Guest lectures from Prof. Ventsch and Dr. Gilfillian of Gloucester Laboratory were much appreciated.

*c. Geological Oceanography (GEOL 752) was taught Spring 1971 by Dr. Webb. Not all Marine Sciences students took it and it will need to be offered in the Spring 1972.

d. Special Problem - R/V EASTWARD (MARSCI 700) was taught Spring 1971 by Cole during 17-22 March cruise from Brunswick, Georgia to Charleston, South Carolina; 11 students (4 Marine Sciences Program) participating. Dr. Levin also participated. Our next cruise--Charleston, South Carolina to Beaufort, North Carolina--March 24-30, 1972, has been approved.

*e. Physical Oceanography (GEOL 655), scheduled for Fall 1971, was to have been taught by Dr. Hayes but it has had to be postponed until

* core curriculum requirement.

Spring 1972 because Dr. Hayes is presently overcommitted. Students needing Physical Oceanography for core requirement will enroll during Spring 1972 and will be held on the comprehensives only for the material covered up to the time of the examination. They will be expected to complete the course, however.

8. Staffing Problems.

a. Biological oceanographer. Following the decision to staff the Amherst campus with a biological oceanographer, a Search Committee of Cole (chairman), Wilce and Edwards was formed. After deliberation, an offer was made to Lawrence Klapow, who is just now completing his degree at Scripps. He will teach Introductory Oceanography this Fall and Biological Oceanography in the Spring.

b. Physical oceanographer. Difficulty in scheduling Physical Oceanography into Dr. Hayes' overextended schedule plus student pressure indicates that a physical oceanographer is our next highest staffing priority on the Amherst campus.

c. Program chairmanship. Arthur Gentile is now in charge of external affairs (i.e. liaison with the laboratory group and with budgeting and higher administrative levels within university). The assistant program chairmanship has been held by "Pete" Cole for two years and this position deals with internal affairs such as matters concerning students and faculty on campus, course scheduling, answering inquiries and processing student applications. This load has been possible only because of the outstanding secretarial assistance of Mrs. Symancyk. These services plus those provided by Dean Gentile will shortly need to be brought together into a single office. An on-campus program chairman should become a staffing requirement within the next two years.

d. Student assistantships. One T.A. is now available to the program. We tend to lose students to departments because of assistantship fund lack. Some departments have possibly been "proselytizing" our people into their own programs by avowing that T.A.'s given to their departments are meant necessarily to support only students in that department rather than to see that teaching requirements in that department are met by whoever is qualified. My bias shows, but this problem needs early discussion because it is tending to erode goodwill and cooperation. An agreement by a department to accept a Marine Sciences Program student implies some effort to provide him with working space, faculty guidance, a chance at assistantship money for which he is qualified and nothing hinting at second-class citizenship. There is some need of identifying the student in the Marine Sciences Program by his department affiliation and by his membership in the Program. "Numbers of students" is too vital a statistic administratively to be ignored by either group or their reporting superiors.

9. Student Inquiries and Applications.

Following our discussion last fall regarding what one does with an M.S. in Marine Sciences, active recruiting of incoming students was strongly curtailed for the Fall 1971 and we have not fought too hard the draining off of our present students into other areas. This has to be moderated, however, by the feeling that unless we have a continuing flow of good students into and through the program that the program itself may die enroute and with its death might go university support for the laboratory, courses within the program, etc. A detailed "think" session with student and faculty participation is badly needed to guide us in this program. A retreat-type weekend early in the Fall semester including students, staff and departmental representatives is nearly a MUST. Table 2 lists in detail the status of applications and inquiries up to July 22, 1971.

a. Brochure. Attached is a copy of the "brochure" sent out to all inquiries. Please review and return with corrections by September 20. The next recruiting session is already underway. Most students read the Department of the Navy's "University Curricula in the Marine Sciences and Related Fields" to find us. This seems to be the authoritative guidance manual in the broad field of the marine sciences. There are at least five to ten other similar documents on which our name appears. No flier was sent out in 1970-71 and inquiries still come to Webb and Wilce two years after their tenure in this job. These sources of information to students all generate inquiries and I will answer any general letters of inquiry sent to you that you refer to me; I would prefer to since this allows us to get the numbers organized. The next edition of the Navy's publication should be out shortly. Our copy for this edition was rewritten in November 1970 and we could easily convert this into a revised printed brochure covering both ocean engineering and marine sciences that could replace our mimeographed material. I recommend this be done.

10. "Interfacing" with the Laboratory.

The teaching program has profited from the presence of Prof. Yentsch, his group in Gloucester, and the new laboratory despite the distance and their own troubles in getting into their facilities and starting their own research. I personally have been able to relocate several research projects into the North Shore area because of the laboratory's existence. This will be much easier for all of us to do when additional building space becomes available and when our campus-bound students both in and out of the program can spend considerable time in the Gloucester area. Living accommodations for transient students, space for equipment storage between visits, running sea water availability, classroom space

for transient classes coming down during the academic year for block work and field studies plus thoughts toward an active summer research and teaching program are still ahead. Of crucial importance is solving the housing problem for transient fisheries students and staff working in the Gloucester area. We on the campus need a continuing presence in the Gloucester program to keep our students into the "real world" activities there.

Charles F. Cole
Assistant Program Chairman
Marine Sciences Program

CFC/s

Enclosure

Table 1. Present Students Assigned to Marine Sciences Program.

Name	Area	Date Entered	Status	Advisor	Grad. Hrs.	Ave.	Special Note
1. Clarkson, Priscilla*	Zool.	F 70	Reg.	Edwards	20	3.7	Thesis topic unknown.
2. Clingan, Richard	Geol.	S 71	Prov.	Webb	7	3.4	Thesis topic unknown.
3. Cunningham, William*	Fish.	F 70	Reg.?	Cole	9	3.7	Marshland aerial interpretation.
4. Fisher, Carol	Ag.Micro.	S 71	Reg.	Litsky	14	4.0	Thesis topic unknown.
5. Harris, Gary	Bot.	S 71	Reg.	Wilce	9	3.8	Thesis topic unknown.
6. Hill, George	Ag.Eng.	F 71	Reg.	Zahradnik	n.a.		Aquaculture study.
7. Howe, Jeffrey	Fa.Sci.	F 70	Reg.	Levin ?	21	2.4	Fish processing study. 3.0 Spring 1971.
8. Kent, Graham*	Bot.	F 70	Reg.	Wilce	13	3.0	Thesis topic unknown.
9. Koval, Judith	Zool.	F 70	Reg.	Edwards	14	3.3	Thesis topic unknown.
10. Libey, George	Fish.	F 70	Reg.	Cole	21	3.4	Flounder pesticide load.
11. Luciano, Daniel	?	F 70	Prov.	Cole ?	21	2.9	Probably not returning.
12. Maytum, John	?	F 71	Spec.	Cole	--	-	Spec. wishing Geol. affil.
13. Richter, Daryl	Bot.	F 70	Reg.	Lockhart	23	3.5	Photosynthesis model study.
14. Scheckter, Jeffrey	Zool.	F 71	Reg.	Edwards	n.a.		n.a.
15. Weiss, Michael	Fd.Sci.	F 70	Reg.	Levin	18	2.0	Marine microbiology study. Warned 1/71. 2 C's 6/71. Levin out of town summer.

* on financial aid.

Table 2. Total Inquiries and Applications Processed July 1, 1970 - June 30, 1971

I. Inquiries not resulting in application.

Undergraduate course	1	
Marine Science	23	
" Biology	45	
" Zoology	6	
" Fisheries	10	
" Geology	3	
" Ecology	1	
" Botany	1	
Oceanography	2	
Physical Oceanography	1	
Chemical Oceanography	2	
Ocean Engineering	3	
	Total	98

II. Applications rejected by area (often preceded by inquiries; these are not listed above.

Marine Zoology	13	
" Fisheries	6	
" Geology	4	
" Ecology	1	
" Botany	3	
" Biology	18	
Physical Oceanography	1	
	Total	46

III. Applications accepted, by name

1.	Clingan	Geology	S 71	
2.	Cretsley	Geology	Withdrew	
3.	Fisher	Ag. Micro.	S 71	
4.	Fontaine	Zoology ?	Withdrew	
5.	Harris	Botany	S 71	
6.	Hill	Ag. Eng.	F 71	
7.	Maytum	Spec.	F 71	
8.	Rea	Geology	Withdrew	
9.	Scheckter	Zoology	F 71	
10.	Yarish	Zoology ?	Withdrew	
			Total	10

IV. Late inquiries still current - 3

Total	3

V. Early inquiries

Spring 1972 admission	1	
Fall 1972 admission	3	
	Total	4

Total processing 161

MARINE SCIENCES PROGRAM AT UNIVERSITY OF MASSACHUSETTS

SCOPE OF PROGRAM

The Marine Sciences program at the University of Massachusetts is at the graduate level and leads to the Master of Science degree in Marine Sciences. It is interdisciplinary in nature, offering the student a breadth of knowledge concerning the sea through a core of required courses as well as a variety of specialty options, each of which is a modification of the Master of Science program offered by one of the several cooperating departments.

The program is administered by the graduate school through the Marine Sciences Committee, members of which will advise the student. The program now offers the specialty option in the areas of marine Geology, Botany, Marine Microbial Ecology, Zoology, Fisheries, Food Science and Technology, and Engineering. In addition, supporting work may be done in Environmental Engineering, Ocean Engineering, Statistics, and other areas. With training in biological, geological, and physical aspects of the marine environment, the Master of Science graduate will be prepared to continue work for the Ph.D. in a specialized marine science field or to go directly into non-academic marine work.

REQUIREMENTS

Students entering the Marine Sciences program should have completed an undergraduate degree in science or engineering, and should have at least one year each of college biology, chemistry, mathematics, and physics. A student may be permitted to enter with deficiencies, but should make these up by completing the appropriate undergraduate courses during his first year of residence in the Marine Sciences program. Credits earned by taking such deficiency courses may not be used to satisfy the graduate degree requirements. Exceptions to this rule may be made in special cases.

Admission requirements may be summarized as follows:

a. At least one year of undergraduate work in each of the following areas: Biology, Chemistry, Mathematics, and Physics.

b. A bachelor's degree in science or engineering.

c. Admission to the Graduate School of the University and acceptance by the Interdisciplinary Committee in Marine Sciences.

d. For some specialty options, results of the Graduate Record Examination are required.

COURSE WORK IN THE PROGRAM

Every student will take a core of three 3-credit courses:

a. Physical Oceanography (Geology 655), Mr. Hayes.

b. Geological Oceanography (Geology 752), Mr. Webb.

c. Biological Oceanography (Marine Sciences 501), biological staff.

In addition, the student takes a minimum of 15 credit hours in the specialty option of his choice (Geology, Botany, Zoology, Fisheries, Food Science and Technology, Marine Microbial Ecology, or Engineering). These may be taken in one or more departments, but with a minimum of 6 of these credits in the student's chosen area. At least 6 credits must be in the 700-900 courses, which may include seminar credits. The individual's particular course of study will be selected in consultation with his advisor, governed by his interests and scientific background.

The following is a list of courses appropriate to inclusion in the specialty option:

BOTANY

BOT 521 Plant Ecology
BOT 522 Autecology
BOT 528 Genecology
BOT 531 General Mycology
BOT 541 Phycology
BOT 561 Biology of Lower Plants
BOT 721 Advanced Plant Ecology
BOT 731 Advanced Mycology
BOT 741 Advanced Phycology
BOT 750 Plant Photosynthesis

FISHERIES

FB 565 Techniques of Fisheries Biology
FB 567 Laboratory in Techniques of Fisheries Biology
FB 570 Ecology of Fishes
FB 572 Introduction to Marine Fisheries
FB 700 Special Problems in Fisheries Biology
FB 701-2 Seminar
FB 756 Fisheries Biometrics
FB 757 Advanced Fisheries Management

GEOLOGY

GEOL 655	Physical Oceanography
GEOL 666	Pleistocene Geology
GEOL 670	Geophysics
GEOL 716	Geochemistry
GEOL 723	Sedimentary Petrology
GEOL 745	Paleoecology
GEOL 751	Sedimentation
GEOL 752	Geological Oceanography
GEOL 756	Coastal Processes
GEOL 771	Physics of the Earth
GEOL 772	Advanced Geophysical Interpretation Techniques
GEOL 782	Petroleum Geology
GEOL 846	Cenozoic Stratigraphy

OCEAN ENGINEERING

OE	510 (CE 559)	Engineering Oceanography
OE	530 (CE 580)	Materials in the Ocean Environment
OE	550 (EE 587)	Marine Instrumentation
OE	570 (CE 590)	Engineering Design of Ocean System Payload Devices
OE	571 (CE 591)	Deep Ocean Systems Engineering and Design I
OE	591 (MAE 555)	Aquacultural Engineering Systems
OE	701 (EE 742)	Underwater Acoustics
OE	711 (CE 751)	Fluid Mechanics of the Oceans
OE	712 (CE 752)	Ocean Wave Theory
OE	721 (EE 741)	Energy Storage and Conversion
OE	731 (CE 781)	Materials for Submarine Structures
OE	751 (EE 743)	Navigation
OE	752 (EE 736)	Dynamics and Control of Marine Vehicles
OE	761 (CE 724)	Submarine Soil Mechanics and Foundation Engineering
OE	763 (CE 783)	Structural Mechanics of Deep Submersible Vehicles
OE	764 (CE 737)	Coastal Structures
OE	765 (CE 738)	Analysis and Design of Offshore Structures
OE	772 (CE 792)	Deep Ocean Systems Engineering Design II
OE	773 (CE 793)	Public Policy and the Use of the Seas
OE	774 (CE 794)	Fundamentals of Naval Architecture
OE	775 (CE 795)	Ocean Engineering Field Laboratory I
OE	776 (CE 796)	Ocean Engineering Field Laboratory II
OE	777 (CE 764)	Coastal Engineering
OE	781 (CE 758)	Design of Closely Confined Manned Operations Stations

MARINE SCIENCES

MS	501	Biological Oceanography
MS	525	Introductory Oceanography
MS	550	Microbial Ecology of Marine Environment
MS	700	Special Problems in Oceanographic Techniques (EASTWARD Cruise)

ZOOLOGY

ZOOL 575	Biology of Protozoa
ZOOL 581	Biology of Lower Invertebrates
ZOOL 582	Biology of Higher Invertebrates
ZOOL 583	General Parasitology
ZOOL 600	Vertebrate Zoology
ZOOL 602	Ichthyology
ZOOL 637	Ecology
ZOOL 666	Vertebrate Physiology
ZOOL 670	Comparative Physiology
ZOOL 740	Advanced Invertebrate Zoology
ZOOL 744	Metazoan Symbiosis
ZOOL 755	Systematics and Evolutionary Mechanism
ZOOL 757	Population and Community Ecology

GLOUCESTER MARINE LABORATORY

In June 1970 the University acquired property for a marine station at Hodgkin's Cove in Gloucester, Massachusetts. Gloucester has been a traditional home for the commercial fishing fleet working Georges Bank and a center for modern fish processing plants. It is also close to the Electronics-Industrial Belt surrounding Boston and is near to the Plum Island National Wildlife Refuge and the extensive salt marshes of Ipswich. Professor Charles Yentsch has accepted the directorship of this facility. Currently one laboratory building is undergoing renovation and will be the center for work on the resources of inshore phytoplankton to environmental stress. Plans are being laid for an additional teaching-research building and other needed facilities. It is possible for field trips and limited research to be conducted at the present site or for more extensive research in the near future.

RESEARCH WORK IN THE PROGRAM

The student will do a research problem, either as a special problem or as a thesis:

a. Marine Science 700 (Special problem) up to 6 credits.

b. Marine Science 800 (Master's thesis), 6-8 credits.

The choice between the thesis and the special problem will be made with regard to the requirements of the department in which the student elects his specialty option. The work will be done under the direct supervision of a faculty member from the department of the student's choice who is himself actively engaged in marine-oriented work, although he need not be a member of the marine sciences committee.

OTHER REQUIREMENTS IN THE PROGRAM

a. The degree candidate must pass a comprehensive written examination on the subject matter of the core curriculum.

b. The degree candidate must pass a qualifying examination in the chosen specialty option similar in general to the qualifying examination which may be required in that department.

c. In some specialty options, the degree candidate must pass the graduate reading examination or its equivalent in one foreign language (French, German, or Russian).

FACILITIES

The program presently centers around the classroom, laboratory, and library facilities on the Amherst campus of the University of Massachusetts, where faculty and students normally are in residence. These are located mostly in Morrill Science Center (Botany, Geology, Zoology), in Chenoweth Laboratories (Food Science and Technology), in Holdsworth Hall (Fisheries), in Marshall Hall (Marine Microbial Ecology), and in the School of Engineering Buildings, with libraries in Morrill, Chenoweth, Holdsworth, and Engineering.

In addition, certain staff members now have laboratory use privileges, by arrangement, at the Woods Hole Marine Biological Laboratories and at the Bureau of Commercial Fisheries laboratory in Gloucester, and similar arrangements can be made for appropriate student research projects. The University is presently arranging for its own quarters in the Gloucester area, which will include both a coastal research station and housing facilities. The University maintains a property on Nantucket Island which may be used by arrangement. Likewise, field projects may be based, as some are presently, upon rented quarters and trailers located at appropriate coastal sites. These temporary quarters provide a degree of flexibility of value to those engaged in estuarine and coastal research who need to be close to their research area for some period of time.

The University maintains a number of trailer-transported motor boats for work in coastal waters, and anticipates acquisition of a larger coastal boat. University staff and students participate in research and training cruises on deep sea vessels by arrangement with cooperating institutions,

including Woods Hole Oceanographic Institution, University of Rhode Island, and Duke University. It is anticipated that offshore marine work requiring large vessels will continue to be done through such arrangements for at least the next several years. In addition to the above mentioned research institutions maintaining sea-going vessels, the Gloucester community is able to get University workers to sea on a variety of fishing vessels as well as on the research vessel of the Bureau of Commercial Fisheries.

CURRENT RESEARCH PROJECTS

Research projects now in progress involve a wide variety of disciplines and localities. They include, in geology, a comprehensive program of studies of estuarine and coastal erosion and sedimentation in New England and Alaska with particular regard to the effects of high tidal range, and a structural study of the continental shelf off eastern Canada; benthic marine algae of the Arctic, eastern Canadian, and New England waters, in botany; population ecology of benthic marine invertebrates, sensory physiology and behavior of marine anthropods, comparative embryology and cytology of marine invertebrates, and comparative physiology of marine fishes in zoology; seasonality of ichthyoplankton and effects of pesticides in estuaries, sport fishery surveys, and life history studies, in fisheries; pesticide degradation and survival of pathogens in the sea, in microbial ecology; studies of irradiation, storage time and other factors affecting palatability of marine products, and phage typing of psychrophiles, in food science and technology; and aquaculture of clams, in agriculture and food economics. In addition, interdepartmental comprehensive studies are being made in estuaries, in water pollution, ground water, and marine bacteria and viruses. The interdisciplinary nature of the marine sciences working group encourages such cooperative studies.

Research in the School of Engineering includes studies in environmental engineering, and in design and development of research submersibles. Although Engineering operates a separate and parallel graduate program in ocean engineering, the School maintains a close and cooperative relationship with the marine sciences group, and offers facilities available to it.

FINANCIAL ASSISTANCE

Financial assistance is available through a variety of programs. Certain research projects are financed by outside agencies and may provide for student aid and expenses in the form of Research Assistantships. In addition, University Graduate Fellowships and a variety of Federal fellowships are available to qualified students. Teaching assistantships involve laboratory teaching, generally in cooperating departments, so that a marine science student might do his assistantship in the department of his own specialty option.

Details concerning financial assistance programs may be obtained from the Graduate School catalog, and any further information may be requested by writing to the Graduate School office or to

Dr. Charles F. Cole, Assistant Chairman
Marine Sciences Program
Holdsworth Hall
University of Massachusetts
Amherst, Massachusetts 01002

Information as to specific research programs can best be obtained by writing to the appropriate member of the Marine Sciences Committee, as listed below:

Marine Botany: Prof. Robert Wilce, Department of Botany, Morrill Hall

Coastal Geology: Prof. Miles O. Hayes, Department of Geology, Morrill Hall

Civil and Ocean Engineering: Prof. William Heronemus Engineering Building

Marine Fisheries: Prof. Charles F. Cole, Department of Forestry and Wildlife Management, Holdsworth Hall

Marine Food Technology: Prof. Robert E. Levin, Natural Resources Project, Chenoweth Hall

Marine Microbial Ecology: Prof. Warren Litsky, Environmental Sciences, Marshall Hall

Marine Zoology: Prof. D. Craig Edwards, Department of Zoology, Morrill Hall

Marine and Petroleum Geology: Prof. Gregory W. Webb, Department of Geology, Morrill Hall

All of the above at - University of Massachusetts
Amherst, Massachusetts 01002

November 1970

PERSONNEL

Ian Morris	Visiting Professor, University College London
John C. Laird	Research Associate
James R. Sears	Research Associate
William Owen	Research Assistant
Nicole R. Daley	Senior Clerk
Lois Strube	Research Assistant
Edward S. Gilfillan	Research Associate
Peter Prybot	Research Assistant
Clarice M. Yentsch	Research Associate
Hilary Hosmer	Research Assistant
William Murphy	Marine Technician

FACULTY

Charles S. Yentsch	Professor of Oceanography Director, Marine Station

STUDENTS

Jerry Topinka	Graduate Student

FISCAL YEAR APPROPRIATIONS

Research Trust Fund	$130,000

GRANTS AND CONTRACTS

Atomic Energy Commission - AEC AT(30-1)4241. "The Interrelationship of Hydronamical Processes and Organic Production in the Ocean" Sept. 15, 1970 - Sept. 14, 1971.

National Science Foundation - NSF GA 27082. "Some of the Factors Effecting the Production and Distribution of Chlorophyll Derviatives in the Marine Environment" April 1, 1970 - March 31, 1972.

National Science Foundation - NSF GA 29501. "Interrelationship between temperature and the Photosynthesis of Marine Phytoplankton with Reference to Some of the Biochemical Mechanisms" May 15, 1971 - May 14, 1973.

Office of Water Resources Research, Dept. of Interior - A Study of the Possible Effects of Organochloride Pesticides on Primary Productivity and Skeletogenesis of New England Estuarine and Coastal Marine Algae.

GRANTS AND CONTRACTS, Con't

Research Council, Univ. of Mass. at Amherst -- Increase in Lobster Production with Artificial Reefs - conducted by Dr. James R. Sears

Research Council, Univ. of Mass. at Amherst -- "The Physiological and Population Dynamics of Populations of *Mytilus edulis* from Clean and from Polluted Environments. -- Dr. Edward S. Gilfillan

Pending Grants and Contracts:

U.S. Coast Guard - "Biological Indicators of Oil Pollution" Drs. James R. Sears, Charles S. Yentsch, Edward S. Gilfillan.

PUBLICATIONS

Ian Morris, Clarice M. Yentsch, Charles S. Yentsch. "Interrelationship between light carbon dioxide and dark carbon dioxide by marine algae." *Limnology and Oceanography*, 1971

Ian Morris, Clarice M. Yentsch, Charles S. Yentsch. "The Physiological state with respect to nitrogen of phytoplankton from low-nutrient subtropical water as measured by the effect of the ammonium ion on the dark carbon dioxide fixation." *Limnology and Oceanography*, 1971.

Charles S. Yentsch, "The Absorption and Fluorescence Characteristics of Biochemical Substances in Natural Waters." Symposium on Remote Sensing in Marine Biology and Fishery Resources, Texas A&M University and FAO Publication.

Charles S. Yentsch, "THE FIELDS OF THE SEA: The Harvest -- Primary Production." *Deep Oceans*, 150-164, 1971.

IN PRESS

Clarice M. Yentsch, J. Perras, Charles S. Yentsch. "Alkaline phosphatase activity in *Oscillatoria erythraea*, *Gymodinium breve*, and other natural populations of marine phytoplanktors."

Clarice M. Yentsch, Charles S. Yentsch. "Distribution of *Oscillatoria erythraea* in the Florida Straits."

Clarice M. Yentsch, Charles S. Yentsch. "Photosynthetic pigments and photosynthetic characteristics of the bluegreen alga *Oscillatoria erythraea* during bloom conditions.

PUBLICATIONS IN PRESS (con't)

Edward S. Gilfillan, "Seasonal and Latitudinal Effects on the Response of *Euphausia Pacifica* Hansen (Crustacea) to Experimental Changes in Temperature and Salinity", *Biol. Oceanography of the No. North Pacific Ocean* - ed: Masateru Anarku, Pub: Idemitsu Shoten

Edward S. Gilfillan, "Reactions of *Euphausia Pacifica* Hansen from Oceanic, Mixed Oceanic-Coastal and Coastal Waters of British Columbia to Experimental Changes in Temperature and Salinity." *Journal of Experimental Marine Biology and Ecology*.

MEETINGS ATTENDED AND PROJECTS OUTSIDE

Charles S. Yentsch: "Symposium on Remote Sensing in Marine Biology and Fishery Resources"
January, 1971
Texas A&M University

James R. Sears: is acting Chairman of the Committee for the Protection of Salt Marshes -- Cape Ann Environmental Coalition.

Studies of the interaction of dark fixation rates and population concentrations of marine phytoplankton suggest that the products of the world's oceans have been estimated to be too low. Our evidence indicates that the value from some areas should be twice as high.

In contrast to previous thought, extreme nitrogen deficiencies do not exist in the open ocean; although there is some indication of a limitation by Nitrogen for the growth of marine phytoplankton. On the technical side, we have developed a system by which we can concentrate natural populations of marine micro-organisms 200-fold. This is done without harming the organisms.

Dr. James R. Sears has completed a comprehensive study of the ecology and taxonomy of the attached algae in the Cape Cod region. This is a detailed study of the seasonal sequence of attached plants in the subtidal environment. As such, it represents a step forward in our understanding of how these communities respond to environmental changes in temperate waters.

Dr. Edward S. Gilfillan has completed studies in zooplankton physiology which indicated that specific populations of Euphausids are ecologically isolated because of salinity. This has been demonstrated by measurements of respiration in response to salinity changes. Most in-shore Euphausids maintained a high respiration rate associated with near-shore salinities. In contrast, populations of offshore Euphausids maintain maximum respirations at salinities characteristic of the open ocean.

Dr. Clarice M. Yentsch is heading up a program which is a cooperative effort between the U. Mass. Marine Station and the Gloucester Public School system that will be an oceanography course for approximately 80 elementary school children, as part of a summer science enrichment program. This program is scheduled to run for six weeks during the summer.

Dr. Ian Morris, visiting professor from the University College of London will be working at the laboratory for a period of five months. Dr. Morris is a noted authority on photosynthetic carbon fixation, and will be examining the interrelationship of carbon fixation by plankton algae and water temperature.

By 1972 the University is expected to expand the facilities of the Marine Station sizably. The expansion priority includes further laboratories and shop facilities, residence for visiting investigators and purchase of a sixty to seventy foot trawler type vessel for operation in Ipswich Bay and throughout the Gulf of Maine. Until the time of acquisition of the larger vessel, a small boat will be available for work in Ipswich Bay and for work in the open ocean. Ship time will be satisfied either from the University of Rhode Island, Duke University, Woods Hole or Nova University. Fishing trawlers and other vessels outfitted for oceanographic exploration are available in Gloucester on a rental basis.

PROPOSED FUTURE FACILITIES FOR MARINE RESEARCH

The renovation of the marine laboratory has envolved the repairing of the roof and exterior of the existing building, and remodeling of the interior to meet the needs of a ten man laboratory. Cost of this renovation has been 115,000 dollars.

Whereas this activity will satisfy the laboratory needs of Dr. Yentsch and his colleagues, it still will not be a useable sea-going facility, or provide space for those on the Amherst Campus wishing an outlet to the sea. To correct this we propose that additional facilities be made available at the Marine Site in the following priority. The amount is not to exceed 500,000 dollars.

1. Dock and Staging: The dock on the property is in need of repair. Some of the structure has been destroyed by fire, the remainder is in sad state of deterioration. It is proposed that the existing structure be repaired, pilings replaced and the entire structure modified to include a high and low level staging area, floating sections, stairways and tie up facilities for vessels up to 150 feet in length. The dock should be piped with fresh and seawater outlets and have electrical connections for both 110 and 220 volts.

2. Classroom Laboratory Facility: Extension of existing laboratory to add an additional 4500 square feet of space. One portion would be for laboratory and office space for Amherst scientists and visiting investigators. The other portion would be a laboratory teaching area. The breakdown of space is as follows:

   a. 10, 200 square feet wet laboratory cubicles.

   b. 1, 800 square feet classroom, laboratory equipped with seawater tables.

c. 1, 1000 square feet classroom.

d. 1, 200 square feet for personal services.

3. Ocean Engineering Facility: An open span type building of about 5,000 square feet is needed to house sea side activities associated with the engineering associated with ocean studies. This facility will include areas for a machine shop, electronics, pattern making, welding, pressure testing, office space and storage. The breakdown of space is as follows:

a. 1, 2000 square feet open heavy workshop including areas for layout, welding and storage.

b. 1, 250 square feet laboratory for stress and pressure testing.

c. 5, 100 square feet for office cubicles.

d. 1, 1000 square feet for wood working shop.

e. 1, 500 square feet for machinery instrumentation.

f. 1, 500 square fset for electronic instrumentation.

g. 1, 250 square feet for personal services.

4. Library-Lecture Auditorium: This complex would be about 4,000 square feet of space. It will include an area for lectures and a library with reading room.

a. 1, 2500 square feet stacks.

b. 1, 500 square feet office.

c. 1, 500 square feet reading room.

d. 1, 500 square feet lecture conference room.

A N N U A L R E P O R T

University Health Services
University of Massachusetts
Amherst, Massachusetts

1970-71

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I. PRELIMINARY FINANCIAL SUMMARY FOR STUDENT HEALTH TRUST FUND

	1968-69	1969-70	1970-71
A. Appropriation/Income	$914,759[1]	$1,149,661[1]	$1,404,400[1]
B. Actual Expenditures			
401 Salaries, permanent positions	698,890[2]	970,279[2]	1,071,000[2]
403 Wages, miscellaneous personnel	14,131[3]	9,319[3]	14,000[3]
404 Food	14,600	10,413	11,300
406 Housekeeping supplies	14,893	16,438	14,500
407.1 Drugs and medications	28,804	40,191	51,250
407.2 Laboratory supplies	16,679	20,890	30,000
407.3 X-ray supplies	4,623	7,394	8,850
407.4 Medical-surgical supplies	8,065	8,238	9,000
410 Travel	5,544	7,402	7,800
414 Administration	23,248	25,930	27,750
415 Equipment	11,704	12,894	11,000
Other accounts: clothing, repairs, printing, refunds, permanent reserve	37,204	31,722	65,600
Total actual expenditures	$878,963[4]	$1,161,115[4]	$1,322,050[4]
C. Balance Carried Forward (needed for July-August expenses)	$ 35,796[5]	$ (-11,454)[6]	$ 82,350[5]

[1]Includes balance from previous year.

[2]Does not include: retirement contribution, health insurance contribution, and assistance from other sources.

[3]Does not include assistance from other sources.

[4]Not included in operating expenses are: maintenance of building, utilities (heat, light, water, sewer), and amortization of cost of building and original equipment.

[5]Cash balance (excluding Summer School receipts collected in June)

[6]Deficit balance (excluding June receipts)

II. PERSONNEL

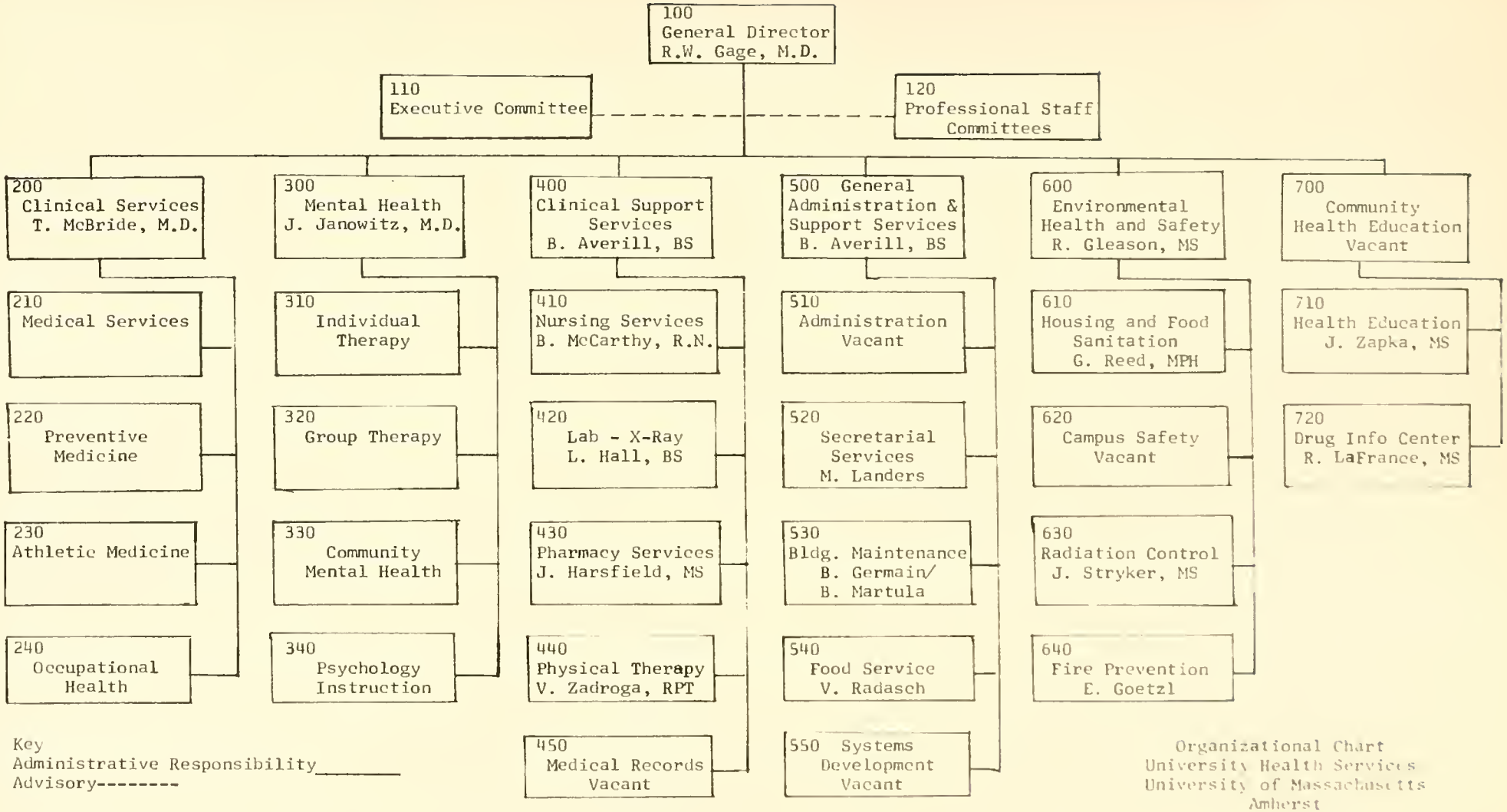
	1968-69	1969-70	1970-71
A. General Direction			
Director, University Health Services	1	1	1
Assistant Director, Administration	1	1	1
B. Medical Staff			
Assistant Director, Clinical Affairs	1	1	1
Staff Physician, full-time	8	9	10
Radiologists, part-time	4	4	4
Orthopedist, part-time	1	1	1
C. Mental Health Staff			
Director of Mental Health	1	1	1
Staff Psychiatrist	1	-	1
Clinical Psychologists, full-time	5	5	6
Clinical Psychologists, part-time	1	1	1
Psychiatric Social Worker	1	1	1
D. Environmental Health & Safety Staff			
Director of Environmental Health & Safety	1	1	1
Environmental Health Specialist	1	1	1
Radiation Physicist	-	1	1
Fire Prevention Inspector	1	1	1
Mechanical Handyman	1	1	1
E. Health Education Staff			
Health Educator, full-time	-	1	1
Health Educator, part-time	-	-	2
F. Laboratory Staff			
Director of Laboratory	1	1	1
Senior Medical Technologist	1	1	1
Laboratory Technicians	2	1	2
Laboratory Technician, part-time	2	-	-
Clinical Laboratory Assistants	-	3	1
Clinical Chemist	1	1	1
Clinical Microbiologist	1	2	2
G. X-Ray Staff			
X-Ray Technician, full-time	2	2	1
X-Ray Technician, part-time	1	1	1
H. Physical Therapy Staff			
Physical Therapist, full-time	1	1	1
Physical Therapy Assistant, full-time	-	-	1

II. PERSONNEL

I. Pharmacy Staff	1968-69	1969-70	1970-71
Director of Pharmacy	-	1	1
Staff Pharmacist, full-time	1	1	1
Staff Nurse, full-time	1	2	2
Staff Nurse, part-time	1	-	-
J. Nursing Staff			
Supervisor of Nursing Services	1	1	1
Assistant Supervisor	1	1	1
Head Nurse, full-time	3	3	4
Head Nurse, part-time	1	2	2
Staff Nurse, full-time	12	9	8
Staff Nurse, part-time	13	12	10
Licensed Practical Nurse, full-time	1	2	2
Licensed Practical Nurse, part-time	2	2	1
Hospital Aide, full-time	5	6	5
Hospital Aide, part-time	6	3	4
Hospital Orderly, full-time	-	1	2
Ward Clerk, part-time	1	1	1
Physician Aide, full-time	4	4	5
K. Medical Records and System Staff			
Records and Systems Manager	-	-	1
Medical Records Librarian	-	1	1
Senior Records Clerk	1	1	1
Diagnostic Coding Clerk, part-time	2	2	2
Medical Records Clerk, full-time	3	3	4
Programmer, part-time	1	1	1
Systems Programmer, part-time	-	1	2
L. Secretarial Staff			
Supervisor of Secretarial Service	1	1	1
Principal Clerk	-	1	1
Senior Clerk Stenographer	1	-	-
Medical Secretary, full-time	5	6	5
Medical Secretary, part-time	2	2	2
Junior Clerk Stenographer	-	1	1
M. Business Office Staff			
Bookkeeper	1	1	1
Senior Clerk Stenographer	1	1	1
Billing Clerk	-	-	1
Storekeeper, full-time	-	1	1
Storekeeper, part-time	1	-	-

II. PERSONNEL

N. Food Service Staff	1968-69	1969-70	1970-71
Head Cook	1	1	1
Cook	1	1	1
Assistant Cook, full-time	2	2	2
Assistant Cook, part-time	-	-	1
Kitchen Helper, full-time	2	2	2
Kitchen Helper, part-time	1	1	-
O. Maintenance Staff			
Head Janitor	1	1	1
Janitor	2	2	2
Head Housekeeper	1	1	1
Housekeeper, full-time	5	5	5
Housekeeper, part-time	1	1	1
P. Student Workers (all part-time)			
Visitor Monitors	2	4	3
Janitor	-	-	1
Kitchen Helpers	6	5	3
Laboratory Technicians	1	4	3
Orderly	5	7	7
Driver	3	7	4
Fire Protection Assistants	-	11	15
Radiation Safety Assistant	-	-	2
Food Inspection Assistants	-	-	3
Physical Therapy Assistant	-	1	-
Clerical Assistants	-	2	2
Pharmacy Assistants	-	2	-
Health Education Assistants	-	1	3
Nurses Aide	-	-	1



Key
Administrative Responsibility_____
Advisory--------

Organizational Chart
University Health Services
University of Massachusetts
Amherst
July 1, 1970

UHS 105-1 (7/1/70)

IV. PRELIMINARY UTILIZATION OF SERVICES

	1968-69	1969-70	1970-71
A. Students enrolled[1]	16,552	18,865	20,462[1]
B. Services rendered			
1. Outpatient visits, total July 1 - June 30	67,740	70,040	79,400
2. Mental Health Service visits, individual	4,449	5,082	5,257
Group therapy (patient) hours)	494	533	941
3. Laboratory (number of determinations)	44,208	55,957	59,500
4. X-ray service (number of patients)	4,848	4,606	5,400
5. Physical Therapy			
Number of patient visits	4,466[2]	5,900	5,500
Number of treatments	---	7,930	6,600
6. Pharmacy (number of prescriptions)	32,443	44,398	57,827
7. Inpatient services:			
Bed patients, total	2,130	2,145	1,900
Patient days in Infirmary	7,881	7,383	5,932
Length of patient stay	3.70	3.44	3.12

NOTES

[1]Includes undergraduates and graduates, September 1970, including special and part-time students, some of whom are not eligible for care by the Health Services. Estimated number of students served for 1970-71 = 19,125.

[2]July 1, 1968 - May 16, 1969 (Physical Therapist resigned May 16, 1969)

V. PROFESSIONAL ACTIVITIES, PUBLICATIONS, AND RESEARCH PROJECTS

ALLEN, DEAN A., Ph.D. (Chief Clinical Psychologist)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Personnel and Guidance Journal, regular abstracter for Journal of the American College Health Association

American College Health Association, member, chairman, membership, Mental Health Section

Massachusetts Psychological Association, fellow

American Psychological Association, member

State of Massachusetts, Certified Psychologist

Professional Activities (within the University)

Psychology Department, Clinical Associate, Ph.D. comprehensive examination committees

Upward Bound, Advisory Board

Draft Counseling Services, Faculty Advisor

PUBLICATIONS

"Underachievement is Many-Sided", Personnel and Guidance Journal, 49, #7, p. 529-532

AVERILL, BARRY W., B.S. (Assistant Director for Administration)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association, Chairman-elect, Administration Section, 1971-1972

American College Health Association, Chairman, Management Systems Development Committee, 1969-1972

American College Health Association, Chairman, Uniform Cost Reporting Project with the American Hospital Association, 1970-1972

American College Health Association, elected to Council of Delegates, 1971-74

American College Health Association, member of Evaluation and Certification Panel, 1969-1972

University of Kentucky, consultant

Yale University, consultant

AVERILL, BARRY W., B.S.

Professional Activities (within the University)

Management Negotiation Team, Master Contract, AFL-CIO, Unit 41, Local #1776, member, March-May 1971

Chancellor's Committee on Non-Academic Professional Personnel Policies, member January-May 1971

Faculty Senate Committee on the Reorganization of the University Health Program, member, 1971-1972

University Committee on Human Subject Review, member

Department of Industrial Engineering, member of Graduate Thesis Committee

School of Business Administration, consultant, Doctorate Committee, "The Integrated Management Control Audit"

PUBLICATIONS

"Use of Automated Information Systems in the Management and Evaluation of College Health Programs", Journal of the American College Health Association, October 1970, Vol. 19, Number 1

"The Outpatient Care Delivery System--A New Approach", presented at the American College Health Association Meeting, San Francisco, April 1971, submitted for publication with E.J. Rising, Ph.D., T. McBride, M.D., R.W. Gage, M.D., and G. Piedmont, Ph.D.

"Computerized Appointment System", presented by R. Baron at the American College Health Association Meeting, San Francisco, April 1971, submitted for publication with E.J. Rising, Ph.D. and T.J. Los

"The Effects of Operations Research on the Outpatient Care System", presented by E.J. Rising at the American College Health Association Meeting, San Francisco, April 1971, submitted for publication with R. Baron

"Automated Intramural Clearance System", to be published jointly with T. Martyn and J. Cotanche, M.D.

RESEARCH PROJECTS, GRANTS, AND REPORTS

Computer Research Support Grant, ($2,500), "Computer Simulation of an Outpatient Medical System", (V11 M3169)

Computer Research Support Grant ($2,500), "Development of a Mental Health Information and Retrieval System", (V11 U3362)

Department of Industrial Engineering, consultant in connection with research proposal submitted to H.E.W., Washington, D.C., ($362,959), "Design and Evaluative Methodology for Outpatient Systems"

BROSCHARD, LEWIS T., M.D. (Assistant Staff Physician)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Internal Medicine Course, University of Colorado, July 20-24, 1970

Professional Activities (within the University)

Department of Physical Education, member, Evaluation Committee, senior honors project

Department of Physical Education, consultant, Master's thesis project

CANN, MICHAEL A., Ph.D. (Clinical Psychologist)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Amherst Planning Board, member

Springfield Goodwill Industries, consultant

Professional Activities (within the University)

Summer Orientation (freshmen), in charge of parents' program

Ad Hoc Personnel Committee, Administrative and Services, elected member

PUBLICATIONS

"Report of a Preliminary Study of Pregnancy on the University Campus", Journal of American College Health, Vol. 19, #2, p. 111-113, with L.B. Siddal, and R.W. Gage, M.D.

CHITTUM, J. RAYMOND, M.D. (Staff Physician)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association, member

American Academy of Occupational Medicine, member

Department of Health, Education, and Welfare, member, Site Visitation Team for project evaluation

Professional Activities (within the University)

Department of Chemistry, lecturer: Toxicology

COTANCHE, JAMES G., M.D. (Staff Physician)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association, member

American Academy of General Practice, member

Massachusetts Chapter of the American Academy of General Practice, member, Education Committee

Hadley School Department, school physician

Professional Activities (within the University)

Pre Med Club, advisor

Department of Intercollegiate Athletics, assistant athletic physician

GAGE, ROBERT W., M.D. (Director, University Health Services)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association, Chairman, Committee on Junior/Community Colleges, 1970-1971

AMA-ACHA Liaison Committee

Speaker, annual meeting, New York State College Health Association, May 1971

Speaker, annual meeting, American Association of Junior Colleges, March 1971

Consultant, Northeast Missouri State College

Massachusetts Chapter, American Academy of General Practice, 2nd Vice-President

Massachusetts Easter Seal Society, member, Professional Advisory Committee

Society for Adolescent Medicine, member

American Public Health Association, member

Professional Activities (within the University)

University Health Council, Chairman

Board of Admissions and Records, member

Faculty Senate, member

GAGE, ROBERT W., M.D.

Professional Activities (within the University) (continued)

Selection Committee for Dean, School of Physical Education, member

Study Committee, School of Nursing, member

University Commission on the Environment, member

Committee for Evaluation of Research Involving Human Subjects, member

Department of Psychology, member, Doctoral Committee

School of Education, member, Doctoral Committee

School of Physical Education, member, Master's Committee

Department of Industrial Engineering, member, Master's Committee

Department of Public Health, Chairman, Personnel Committee

PUBLICATIONS

Manual for Junior/Community College Health Programs, American College Health Association, 1971, editor

"Report of a Preliminary Study of Pregnancy on the University Campus", J. American College Health Association, Vol. 19, No. 2, p. 111-113 (with Siddall, L.B. and Cann, M.A.)

"Developing a Health Program for the Community College", J. American College Health Association, Vol. 19, No. 3, p. 152-158

GLEASON, ROBERT P., M.S., P.E. (Director, Environmental Health and Safety)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American Chemical Society, member

American Industrial Hygiene Association, member

American Society of Safety Engineers, member

Journal of the American Society of Safety Engineers, member, Editorial Review Board

American National Standards Institute, member, Z.9 Committee "Industrial Exhaust Ventilation"

Professional Activities (within the University)

University Health Council, Secretary

Civil Defense, Director

GROSE, ANN H., B.S., R.N., (Assistant Health Educator)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Attended National Foundation Workshop on Adolescent Medicine, September 1970

Participant in Amherst School Health Education Workshop, February 1971

Professional Activities (within the University)

Health Services Student Advisory Board, consultant

Honors Colloquium, coordinator

Medical Emergency Loan Fund, consultant

RESEARCH PROJECTS, GRANTS, AND REPORTS

Application for Faculty Grant, A Peer Sex Education Program, Development and Evaluation (with Jane Zapka)

HALL, LEO B., B.S., (Director of Laboratory and X-Ray Services)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American Association for the Advancement of Science, member

American Society for Microbiology, member

American Society of Medical Technologists, member

Sigma Xi (National Science Research Society), member

Leo F. Rettger Society (Microbiology), member

Medical Mycological Society of America, member

Springfield Academy of Medicine, member

Professional Activities (within the University)

School of Physical Education, advisor Ph.D. thesis

RESEARCH PROJECTS, GRANTS, AND REPORTS

Research Grant from Ortho, Division of Diagnostics: Evaluation of Procedures for Pregnancy Testing (Hall)

Faculty Research Grant FRG-VII-71 (1): Incidence, Causes, and Significance of Microorganisms Associated with Nonspecific Bacterial Vaginitis (Hall - Swarin)

HARSFIELD, JEFFREY C., M.S. (Director, Pharmacy Services)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association

Pharmacy Committee, Chairman

Exhibit Committee, member

Annual Meeting, April 1971, participant

Massachusetts Society of Hospital Pharmacists, member

American Pharmaceutical Association, member

New England Council of Hospital Pharmacists, member

Professional Activities (within the University)

School of Nursing, consultant and lecturer, 1970-71

Psychology Department, consultant, 1970-71

Yale Health Center, New Haven, Connecticut, consultant

Brockton Hospital, Brockton, Massachusetts, consultant

University of Massachusetts/Boston Health Services, consultant

PUBLICATIONS

"Development of Outpatient Pharmacy Services at the University of Massachusetts" Journal of American College Health Association, presented at the 1971 Annual Meeting of the American College Health Association and submitted for publication

RESEARCH PROJECTS, GRANTS, AND REPORTS

Joint with the School of Business Administration. Develop a model inventory system that would minimize the overall cost of ordering pharmaceuticals, with Lawrence Logne and Francis Porter

JANOWITZ, JULIAN F., M.D. (Director of Mental Health)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Sabbatical leave first semester 1970-71, visiting various student health centers to formulate plan for psychiatric rehabilitation

Greenfield Community College Mental Health Technology Program, consultant

American College Health Association Annual Meeting, April 1971, San Francisco, presented paper on "The Preventive Community Model for a University Mental Health Service"

KENDREW, LEROY J., M.D. (Staff Physician)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Amherst Drug Study Committee, member

Hampden Bar Association, lecturer

Springfield High School, consultant

Monson Adult Education, lecturer

Springfield Academy of Medicine, member, board of directors, and president-elect

Massachusetts Medical Society, member, Medico-Religious Committee

Municipal Hospital, Springfield, consulting staff

Wesson Memorial Hospital, Springfield, active surgical staff

Noble Hospital, Westfield, surgical consulting staff

Professional Activities (within the University)

First Aid Instruction Course

School of Nursing, lecturer

School of Home Economics, lecturer

KLEIN, STEPHEN M., Ph.D. (Clinical Psychologist)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

State of Massachusetts Board of Certification in Psychology, certified member

Northfield and Mt. Hermon School, Northfield, Massachusetts, consultant

Department of Psychology, clinical associate

Graduate Faculty, member, Dissertation Committee

LAFRANCE, RONALD C., M.Ed. (Health Educator, Coordinator of Drug Program)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Amherst Drug Study Committee, member

Area Drug Committee, member

LAFRANCE, RONALD C., M.Ed.

Professional Organizations (outside the University) (continued)

Amherst Regional High School, consultant

Amherst Regional Junior High, consultant

Gateway Regional Junior-Senior High School, consultant

Pioneer Valley Regional High School, consultant

Frontier Regional High School, consultant

Easthampton High School, consultant

Adams High School, consultant

Grace Church, Outreach Commission, consultant

Mount Holyoke College, consultant

Franklin Pierce College, consultant

Northern Essex Community College, consultant

New England College, consultant

Northampton Junior College, consultant

University of Delaware, consultant

University of Connecticut, consultant

Queens College, New York, consultant

Greenfield Hot Line

Hartford, Connecticut, Drop-In Center

Professional Activities (within the University)

United Christian Foundation, Board of Directors

Department of Psychology, lecturer

Department of Sociology, lecturer

Department of Public Health, lecturer

School of Nursing, lecturer

NASPA Conference, speaker

RESEARCH PROJECTS, GRANTS, AND REPORTS

Faculty Research Grant with Jane Zapka, M.S. and Michael Cann, Ph.D. for development of a drug education program and drug drop-in center, November 1969

LAFRANCE, RONALD C., M.Ed.

RESEARCH PROJECTS, GRANTS, AND PROJECTS (continued)

Grant from the U.S. Department of Health, Education and Welfare for the further development of the drug education program and drug drop-in center, May 1971

MAC DONALD, R. GENE, M.D. (Staff Physician)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association, member

College of Sports Medicine, member

Amherst Hockey Association, director

Amherst Regional High School hockey team, team physician

Amherst Regional High School, lecturer

MC BRIDE, M.D. (Assistant Director for Clinical Affairs)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American Academy of General Practice, member

American College Health Association, member

Amherst Regional School System, school physician

Professional Activities (within the University)

Department of Public Health, lecturer

Sociology Department, lecturer

Red Cross Instructors Course, lecturer

Hampshire College, college physician

University of Massachusetts School of Medicine, supervised field training

PUBLICATIONS

"The Outpatient Care Delivery System - A New Approach", with Robert W. Gage, M.D., Barry W. Averill, E.J. Rising, Ph.D., E. Piedmont, Ph.D., submitted for publication

MC CARTHY, BARBARA, R.N. (Supervisor of Nursing Services)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American Nurses Association, member

Massachusetts Nurses Association, member

American College Health Association, member

New England College Health Association, Chairman, Nurses' Section

Professional Activities (within the University)

Room-To-Move, member, University Liaison Committee

MC CASHIN, ANDREW W., Ph.D. (Clinical Psychologist)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Massachusetts Psychological Association, member

RESEARCH PROJECTS, GRANTS, AND PROJECTS

In the process of evaluating data in "Techniques in Program Evaluation for the Therapeutic Community", conducted at the Manhattan V.A. Hospital

POEY, KENT, M.S. (Clinical Psychologist)

PUBLICATIONS

"An Exploratory Comparison of Six Role-Related Behaviors in Schizophrnics and Non-Schizophrenics", Developmental Psychology, Vol. I, No. 5, 1970

RALPH, JAMES R., M.D. (Staff Physician)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American Academy of General Practice, member

American College Health Association, member

Massachusetts Chapter of the American Academy of General Practice, member, Education Committee

Yale Alumni in Medicine, member

RALPH, JAMES R., M.D.

Professional Activities (within the University)

Department of Intercollegiate Athletics, assistant team physician

Director of Security Search Committee, member

President's Advisory Committee on Campus Security, member

Adelphia, honorary member

Cooley Dickinson Hospital, courtesy staff

PUBLICATIONS

"Electrophoretic Analysis of Serum Protein in Patients with Infectious Mononucleosis", Journal of the American College Health Association, with Carl F. Brandfass, M.D. and Leo Hall, Vol. 18, No.5

RESEARCH PROJECTS, GRANTS, AND REPORTS

Faculty Research Grant FR-VII-66-1, Hematological Values: A Study Designed to Provide a Statistical Model for Continuing Evaluation of Normal Ranges for Selected Hematological Determinations, with Leo B. Hall

REED, GEORGE H., M.P.H. (Staff Assistant, Environmental Health and Safety)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association, Chairman, Standards Committee, Environmental Health and Safety

American College Health Association, member

American Public Health Association, member

National Environmental Health Association, member

Massachusetts Environmental Health Association, member

Campus Safety Association, National Safety Council, member

Professional Activities (within the University)

Department of Public Health, lecturer

School of Agriculture, lecturer

School of Home Economics, lecturer

Methods of Epidemiological Investigation, "Epidemiological Approaches to Man-Made Health Problems - An Overview", lecturer

REED, GEORGE H., M.P.H.

RESEARCH PROJECTS, GRANTS, AND REPORTS

U.S. Public Health Service Traineeship Grant for Short-Term Training, for 30 traineeships, held March 22 to April 2, 1971, "Methods of Epidemiological Investigation"

REICHERT, KATHARINE E., M.D. (Staff Physician)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American College Health Association, member

American Academy of General Practice, member

RESEARCH PROJECTS, GRANTS, AND REPORTS

Study in progress on effect of vaginal deodorant sprays on occurrence of vaginitis

SIDDALL, LAWRENCE B., M.S.W. (Psychiatric Social Worker)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

National Association of Social Workers, member

American College Health Association, member

Clergy Consultation Service, consultant

Professional Activities (within the University)

Married Student Advisory Committee, Chairman

PUBLICATIONS

"Report of a Preliminary Study of Pregnancy on the University Campus", Journal of American College Health Association, Vol. 19, #2, pp. 111-113, with M.A. Cann, Ph.D. and R.W. Gage, M.D.

"The Pregnant College Girl", Journal of the National Association of Women Deans and Counsellors, January, 1971

RESEARCH PROJECTS, GRANTS, AND REPORTS

A follow-up study of pregnancy on the University campus with Michael Cann, Ph.D.

A project to investigate problems and living patterns among married students in University Housing at North Village, with Drs. Allen and Trewartha, and members of the Department of Psychology

SNOOK, GEORGE A., M.D. (Orthopedic Consultant)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

American Academy of Orthopedic Surgeons, post-graduate course in sports medicine, Buffalo, New York, September 21-23, 1970, faculty member

Care Medico, Kabul, Afghanistan, June, 1970, orthopedic consultant

Professional Activities (within the University)

Department of Intercollegiate Athletics, team physician

New England Intercollegiate Wrestling Association Tournament, Lowell Textile, March 5 and 6, 1971, tournament physician

PUBLICATIONS

"Acute and Subacute Injury in Marathon", Encyclopedia of Sport Sciences and Medicine, Vol. 1, p. 552, 1971

"Chronic Injury in Marathon", Encyclopedia of Sports Sciences and Medicine, Vol. 1, pp. 622-623, 1971

RESEARCH PROJECTS, GRANTS, AND REPORTS

Effects of Aspirin on Articular Cartilage

Achilles Tendinitis in Athletes

Survey of Tibial Fractures

STRYKER, JAY W., M.S. (Health Physicist)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

Health Physics Society (New England and National), member

American Nuclear Society, member

Society of Nuclear Medicine, member

American Public Health Association, member

American Association for the Advancement of Science, member

Sigma Xi, member

Campus Safety Section, National Safety Council, member

STRYKER, JAY W., M.S.

Professional Activities (within the University)

Department of Public Health, lecturer

Department of Public Health, Chairman, Graduate Admissions Committee

University Radiation Use Committee, Chairman

RESEARCH PROJECTS, GRANTS, AND PROJECTS

Research program on the effects of compression of peripheral nerves

Faculty Research Grant FR-WW1-1(71), research program for the construction of a prototype electric-powered cart for the handicapped

ZAPKA, JANE M., M.S. (Health Educator)

PROFESSIONAL ACTIVITIES

Professional Organizations (outside the University)

New England Health Education Association, member

American College Health Association Annual Meeting, presented paper and participated in discussion on community health education

American College Health Association, secretary-elect, Health Education Section

National Foundation Workshop on Adolescent Medicine, September 1970, member

Professional Activities (within the University)

University Health Services Student Advisory Board, consultant

Honors Colloquia, coordinator

Health Workshop, Annual 4-H Conference, June 1970, coordinator

RESEARCH PROJECTS, GRANTS, AND REPORTS

Faculty Grant: A Peer Sex Education Program, Development and Evaluation (with Ann Grose), application pending

During the year a new level of internal understanding and cooperation has been achieved by the medical staff. Essentially independent by both nature and training, physicians often find difficulty in working together smoothly in the interest of providing quality care to large numbers of patients. Subverting individual interests in favor of systematized group activity often is perceived as contradictory to providing individualized patient care. A major catalyst for bringing about this modification of interest has been the inclusion of a preventive thrust in health service delivery, involving all physicians in design of the patient care system. We now see even more progress possible in the future.

Although the medical staff has functioned with a full complement of physicians during the year, the major impact of a slight increase in absence due to illness has impressed upon us the fact that the staffing pattern is much tighter than will lead to optimum service. For the relief of these situations we must look not only to more efficient scheduling of outpatient services but also to either a substantial increase in the professional staff or adoption of means for compensating physicians for extra time spent replacing those who are ill.

The staff was strengthened considerably this year with the addition of three physicians, each of whom brought unique qualities. Dr. Kelley Davis brought with him the experience of some twenty odd years in a busy pediatric practice in Wellesley. His considerable clinical skill has been augmented by sound interest in education and unique ability in verbal expression. Dr. Eugene Madsen contributed, in addition to his considerable clinical ability, a basic public health viewpoint based upon both formal education and experience in health administration. His continuing interest in the effects of the youth counterculture and in health education have been valuable additions to our entire program. Dr. Charles Weeber, coming directly from service in Vietnam, brought the vigor and intensity of youth as an antidote to complacency. We regret sincerely that he will be leaving us after only a year, in favor of private practice in this area.

For the coming year, we look forward with considerable anticipation to the return of Dr. Daniel Clapp, who will be rejoining the staff on a permanent basis following his final two years of missionary service in the Philippines. Dr. Clapp made a deep impression upon both students and staff during his brief year here previously, and we shall be happy to welcome him as a permanent member of the staff. Other new members of the medical staff for the coming year will be Dr. James Caldwell, who will be joining us after two years in the U.S. Public Health Service, where he was attached to the Medical Service for Indians in Arizona; Dr. Frederick Lea, a qualified flight surgeon recently separated from the U.S. Air Force; and Dr. Barry Slater, whose most recent position was with the Upstate New York Medical Center. It is interesting to note that there appears to be an increasing number of young physicians who are interested in general medicine and determined from the outset to find an outlet for their professional interests in a group practice situation.

Dr. Eugene MacDonald, who has been a member of the staff for two years, will be leaving to become head of the Rehabilitation Service at the U.S. Veterans Hospital in Northampton. The entire staff wishes Dr. MacDonald well in his new venture.

VI. SUMMARY OF ACTIVITIES

A. Clinical Services

Continuing the trend of the past few years, outpatient services increased during the year at a rate greater than the increase in student population, with an increase of approximately 16% and 8%, respectively. At that same time, there was a distinct drop in inpatient services, with admissions decreased by 15%, possibly beginning a trend here which has been evident in most other college health programs for the past three or four years. This is a trend which should be watched with considerable interest, since the experience of a well-run prepaid health delivery system should be to increase outpatient services rather than more expensive inpatient care.

An additional factor which has had considerable impact upon medical staff time and resources has been an increase in health problems which require more time for solution. Appendix I contains a more complete summary based on OPD outpatient diagnoses. Attention should be drawn to the considerable increase in outpatient services for mononucleosis, genitourinary problems, venereal disease, and counseling for family planning. In addition, we seem to be in the midst of the predicted rise in Rubella and a considerable rise in Vincent's infections. The reported rise in sinusitis and adverse effects of drugs almost surely is due in large measure to changes in diagnostic criteria; we are certain that there have been fewer admissions for "bad trips."

There has been no relief of the critical space problem except that afforded by internal shuffling of space use, an annual process which seems now to have reached the point of diminishing returns. From now on, increased use of facilities inevitably will be accompanied by decrease in efficiency.

The integration of appointment and walk-in patients, a new system described elsewhere in the report, appears to have been a life-saving procedure, without which survival of high-quality care would have been nearly impossible. The description of this system, which seems to offer considerable promise for the future, was the highlight of one of the administrative meetings at the recent annual meeting of the American College Health Association. The project through which the system was developed epitomizes the way in which management skills can be integrated with the expertise of health professionals in the interest of improving the health delivery system. The trend for setting aside specific areas and times for special services has continued with generally salutary effects upon efficiency of the clinic. The most noticeable example this year was the institution of a family planning information and counseling service, described elsewhere in this report. Another factor contributing to the success of this year's outpatient services has been the development of the Nurse Practitioner Clinic, which also is described elsewhere.

Disaster planning took a step ahead with the formulation of a revised disaster plan and a walk-through drill carried out during intersession. Although every critique of disaster plans emphasizes the necessity of going through a mock disaster drill, we continue to find it very difficult to disrupt the flow of apparently urgent daily tasks with more than a scheduled walk-through drill. Another attempt will be made during the coming year to stage a more realistic mock drill, hopefully before we are called upon for a true disaster.

B. Mental Health

Remedial services to individuals has continued to be the major thrust of the Mental Health Division. Services have increased roughly in proportion to the increase in the student population; the most notable change has been a considerable increase in the number of patients attending group therapy sessions.

The impression that the number of seriously disturbed students has increased during the year is borne out by the observation of approximately 60 per cent increase in inpatient admissions and a corresponding increase in the number of patients hospitalized elsewhere. There were 2 suicides during the year.

The "outreach" program of the Mental Health Division has continued through active liaison with Room-To-Move, the student drug education and drop-in center and other Student Affairs activities, notably the Southwest residential area. Working with the student drug center has had the most nearly positive preventive effects we have observed, at least as far as inpatient admissions for "bad trips" is concerned, since these have dropped off dramatically during the past year. In other areas, the preventive influence of the "outreach" programs is less readily demonstrated--indeed, these activities seem only to provide greater visibility for the staff and an increased patient load. One of the most urgent needs for the future is to devote a larger share of effort in more positive community-oriented preventive programs throughout the campus. This will be a chief thrust of activity for the coming year.

No psychology practicum students were available for assignment this year, so the active teaching program has fallen off considerably. As a consequence, there has been considerable decrease in the total number of conferences held, a decrease which is accounted for entirely through the decreased number of teaching conferences.

Physical separation of the Mental Health Division from the Health Center continued to be a source of grievous problems in liaison, cooperation, and understanding. More attention will have to be devoted to resolving these problems during the year ahead.

Dr. Janowitz, the Director of Mental Health, spent the first semester on sabbatical leave, visiting other student health centers, in particular to see what models are available for the development of psychiatric rehabilitation centers related to college campuses. Dr. Janowitz had hoped after his return to devote major effort to plans for developing this type of center at the University of Massachusetts. Unfortunately, for a variety of personal and professional reasons, Dr. Janowitz has resigned as Director of the Mental Health Division, so plans for more definitive psychiatric rehabilitation facilities will have to await new direction. During his ten years of strong leadership, Dr. Janowitz has developed an outstanding mental health service, which has been staffed continuously by unusually resourceful professionals. In addition to providing highly competent remedial services for individuals, this group has continuously sought ways to become involved in the University community, a move which is now widely accepted as highly desirable in college health programs. Dr. Janowitz's departure will leave a void which it will be difficult to fill.

Dr. Dean Allen has been named Acting Director for the coming year, during which time a broad search will be made for a Director who will be able to provide additional strong leadership, especially in the area of community mental health services.

We note with disappointment the resignation of three additional members of the staff. Miss Eleanor King has been obliged to leave for health reasons, unfortunately long before this had been anticipated; we shall miss her warmth, competence, and good sense. Dr. Anthony Moore is leaving for a position of major responsibility in a college community mental health program in Florida; his departure leaves a large void in professional competence and personal commitment which likewise will be difficult to fill. Dr. Mark Trewartha is returning to Wisconsin to take part in a community research activity. In his one year on our staff he made a uniquely valuable contribution to community outreach, especially in the area of drugs; his departure is a serious loss.

Active recruiting must be relied upon to replace losses and to provide the substance for growth. This seems to have been a fine year for recruiting, and, as a result, we look forward to next year with great hope, in spite of the notable lack of psychiatrists on the staff. Dr. Seymour Cabin, trained in psychology at Ohio State University and Yale, will be joining the staff from his present position with the San Mateo (California) Mental Health Center. Dr. Jeffrey Hersh, a psychologist who is a graduate of Indiana University, comes with high recommendations from the Austen Riggs Center. Mrs. Susan Hill, a psychiatric social worker, received her professional training at Simmons School of Social Work and has had valuable experience in the Roxbury and Springfield Juvenile Courts. Dr. Thomas Wolf, a psychologist who since graduation from the University of Rochester has been associated with the Student Health Service at Case Western Reserve University, comes with an unusually strong interest in community mental health. We look forward to a stimulating year in this area.

C. Athletic Medicine

Active and cordial liaison has been maintained between the Health Services and the Department of Intercollegiate Athletics. The specialized services for athletes have been provided primarily by Drs. Cotanche, Ralph, and MacDonald, with the eager and highly competent assistance of Dr. Snook.

One of the most difficult yearly problems has been that of providing clearance for intramural athletes. Because of the increasing number of student participants, we were faced with an apparent decision between finding a more effective way of providing health clearance or abandoning entirely any review of health information for these students. Using experience gained by processing entrance health information and with the active support of others interested in the project (see Section VII - Special Projects), a system has been devised for having participants provide self-recorded health information which can be reviewed by a computer program directed by the medical staff. Although the system has had only brief trial, it seems to offer a promising alternative for the tedious and inefficient individual review of health records.

The entire athletic medicine program has been subject to critical review by both medical and coaching staffs, with resulting agreement that some economies can be effected in the use of professional time but that the program for yearly health evaluation of all athletes and close medical supervision of the care of injured athletes will continue essentially as before. We hold fast in our proposal that it is appropriate for the Department of Intercollegiate Athletics to support, through a direct contribution to the Student Health Service Trust Fund, a major portion of the special care provided athletes. Without this contribution, it would be clear that the student body in general would be providing an additional subsidy to the athletic program through the student health fee.

D. Laboratory and X-Ray

For the first time in almost a decade there has been a reversal of the trend for a yearly increase in laboratory determinations out of proportion to the increase in student population. For several years increases in student population of 9%-12% have been accompanied by increases in laboratory service of 15%-40%. This year the increase in both subscribers and laboratory determinations has been less than 10%. In addition, it appears that the modification of the appointment system and the addition of a nurse-practitioner clinic has brought about considerable load leveling from day to day--a highly commendable result.

Hematology examinations performed during the year have remained almost constant from the previous year, a net decrease of examinations per subscriber. The explanation for this change in trend is uncertain, as is any prediction for the future. The chemistry section operated at approximately the same level as during the previous year, notably with a 50% reduction in personnel. Mrs. Buteau is to be commended for both the quantity and quality of work which has been done. The microbiology section accounts for most of the increase in laboratory services. This appears to have been the result almost entirely of increased urinary and vaginal tract infections. Increased awareness of the rise in venereal disease has led to much wider surveillance and multiple microbiological procedures.

The participation of the laboratory staff in the laboratory improvement program of the Massachusetts Department of Public Health and the program of the American College of Pathologists once again has been successful and rewarding for all concerned. The consistently fine results on all quality control examinations is a reflection of the considerable effort each member of the laboratory staff puts forth to maintain a high level of proficiency in services performed.

A laboratory bulletin evolved from efforts of the laboratory liaison committee. Although limited to three editions this year, the bulletin has provided a greatly improved means of communication with the medical and nursing staffs and has been a means for introducing significant cost savings in some laboratory procedures. The bulletin was important, furthermore, in providing opportunity for the professional members of the clinical laboratory and x-ray staff to express their individual talents.

During the year two research grants were received. One of these, from Ortho Research Foundations, was for the evaluation of several currently marketed pregnancy tests; the other, from the University Faculty Research Council, was for the investigation of bacterial vaginitis. The Ortho project has led to involvement with the Springfield Hospital Medical Center in a cooperative effort to expand the project and to provide more significant results. Likewise, with the faculty research grant members of the Amherst Medical Associates have agreed to participate with our laboratory. Through this type of collaborative activity a broader population group will be examined and, hopefully, the results will be of greater value.

One new laboratory project this year was the establishment of work standards which helped measure objectively the impact of changes and activity within the laboratory. This enabled the laboratory to identify the number and type of staff needed and to make adjustments when appropriate. The standards contributed materially to the over-all performance of the laboratory staff and helped maintain the cost per test at a minimum level. This important project is one more measure of self-imposed excellence to which we have become accustomed in our laboratory service. We are deeply indebted to Mr. Leo Hall whose dedication, foresight, and energy in directing a highly competent staff has been responsible for consistently

superior laboratory service. It is when we contrast this exceptional service with laboratory services available to other health delivery systems that we realize how fortunate we are.

X-ray services have increased by almost 20% during the year. Better use of an appointment system has spread the load so that the increased volume has been handled effectively with a smaller staff, a tribute to the flexibility of the x-ray staff.

E. Pharmacy Services

The most significant accomplishment of the pharmacy service during this year has been the establishment of a prepackaging system. By standardizing the quantities and directions for use for the most commonly prescribed medications, the system has made possible a much more expeditious dispensing and prescription service. Prepackaging promotes better use of staff during vacation periods and reduces the patient waiting time appreciably; it also makes clearer and more complete directions possible.

The Formulary was completely revised and updated. It now lists over 400 medications, with complete description by generic and trade names, form and strength of the preparations, accepted use, precautions, and relative cost.

Utilization of pharmacy services increased by almost 26% during the year. This increase may be attributed to the following, although the effect of each is difficult to assess.

a. Increase in outpatient visits (approximately 16%).

b. Increased use of pharmacy for cold preparations, formerly handed out directly by OPD nurses.

c. Increase in multiple or more serious medical problems treated by the staff.

d. Extension of pharmacy hours in the evening and on weekends.

e. Establishing the nurse-practitioner clinic.

The cost of prescriptions remain relatively constant ($1.51 per prescription). This is a very favorable figure, compared with that for other schools reporting in the ACHA-AHA Uniform Cost Reporting project (the group median was $2.68 per prescription). Without more details it is difficult to ascribe this low cost to a specific cause. It may be due in part to dispensing many low cost over-the-counter items by prescriptions; it may be related to an inherently lower cost for prepaid pharmacy services and the emphasis on cost saving procedure such as prepackaging. In any event, it is a very clear reflection of the diligence with which Mr. Harsfield has directed this important service and the efficiency with which he has led his staff to perform.

The retirement of Mrs. Esther Cornish after 20 years of faithful and energetic service leaves a large void in the area of central supply. This will be filled, at least in part, by combining central supply, storeroom, and pharmacy under one departmental unit.

F. Physical Therapy

The Physical Therapy Department continued to provide high quality services to a significant percentage of students. Over 5,400 patient visits were recorded in spite of a sharp reduction in the services of our physical therapist due to the lingering effects of an automobile accident which occurred in December.

The staff was greatly enhanced by the addition of a physical therapy assistant, a young woman graduated from a new two-year program which provides training in all modalities. Her presence made it possible for the Physical Therapy Department to continue to provide limited services during the difficult period following Mrs. Zadroga's auto accident.

The department's ability to meet the patients' needs was enhanced further by the acquisition of a pelvic and cervical traction unit and another treatment plinth.

It is hoped that next year the department can enlarge the "back program" initiated two years ago. This would require the continued cooperation of patient, physician, and physical therapist, and would include periodic check-ups by the physical therapy staff after the patient is discharged from active treatment.

G. Medical Records & Systems

Medical records, patient appointments, computer services, information and switchboard, and the admissions office were reorganized and placed under the direction of a manager of medical records and systems. In the few months that these areas have been under Mr. Dubay's supervision, significant improvement in service has been noticed. Greater improvements are anticipated during the next academic year.

A major improvement was made with the establishment of a computerized appointment system. Under the direction of Mr. Averill, two graduate students in Industrial Engineering developed a working model of an on-line computerized appointment system. The new system promised to solve many problems and appeared to be cost-effective. Therefore, it was placed into operation, using a cathode ray tube terminal connected to the Administrative Data Processing Center. Special thanks should be paid to Mr. Ted Los and Mr. Andrew Scott who converted the test design to the actual operating system. The new system accomplished the following:

1. It eliminated the congestion at the appointment desk by shortening the time necessary to make an appointment.

2. It provided better medical service by making more appointment intervals available.

3. It eased the task of medical record retrieval by generating alphabetically sorted patient lists for each day's appointments.

4. It provided expansion capability for the increasing needs of the growing population.

5. It made changes in the appointment system easy to arrange.

6. It reduced confusion and chance for human error.

7. It accomplished the above-mentioned improvements at a cost comparable to the previously used manual system (.79 cents per appointment as compared to .75 cents per appointment for the manual system).

For a full discussion of the computerized appointment system, refer to the article "Computerized Appointment System", by R. Baron, E.J. Rising, B.W. Averill, and T.J. Los to be published in the Journal of the American College Health Association.

A new system for collecting and analyzing mental health service statistics was developed during the year by Mr. Martyn, Dr. Allen, and Mr. Averill. This system will provide more complete data on each patient contact with the mental health service; at the same time it will maintain strict confidentiality, since the patient's identification does not appear in any form on the automated record. The system will produce statistical reports as well as case summaries. It will also provide each therapist with a monthly analysis of his patient activity and remind him of any outstanding actions that might be required, i.e., follow-up letters, phone calls, case summaries. Finally, the system will provide much needed information on community mental health, such as incidence and type of problems in selected residence halls or academic departments which may be used as a basis for development of community mental health or health education programs.

An automated intramural clearance system was developed and tested during the academic year. This system was developed by Dr. Cotanche, Dr. Ralph, Mr. Averill, and Mr. Martyn in close cooperation with Mr. Schmidt, Mr. Novak of the Athletic Department, and Mr. Ross from the Administrative Data Processing Center. The system will provide an easy method for screening over 7,000 students who participate in the University's intramural athletic program. The medical history form developed for the system was used during the year and proved its value by detecting a significant number of problems which might have resulted in increased disability had the students participated in the intramural program. Further description of the system is contained under the section on Research Projects.

H. Health Education

In view of the strong community orientation of the Health Education program, one of the chief objectives has been to establish more effective relationships with students. Since they are both the chief supporters and main beneficiaries of the clinical services and health education programs, we believe firmly that it is both their prerogative and responsibility to hold a strong position in determination of policies and guidance of services and other program activities.

The Health Services Advisory Board was formed again this year in an attempt to establish a regular and continuing format for the expression of student interests and opinion, a function which has been carried on in the past with moderate effectiveness, although very informally. The Board now comprises a small but enthusiastic group which seems actively interested in continuing a close relationship with our staff.

As the Board has developed its interests it has become clear that there are two quite distinct, although related, functions to be served by students. One, that of participating in discussion and decision-making concerning basic policies

and activities, is of special interest to students who have a strong political orientation to their service commitment; the other, which is more project or activity oriented and may consist of active involvement in information, public relations, transportation, education, and other services, is of more interest to students whose orientation is toward direct participation in services. The success of the Advisory Board may depend in large measure on maintaining distinct but coordinated programs in these two areas.

For the past three years it has been a firm policy to expect each candidate for a position on the professional staff to be interviewed by a panel of students. This procedure has been highly successful in providing valuable insight concerning the ease of communication, trust, and general rapport which students could establish with candidates. In no case has there been serious divergence of opinion between students and the professional staff concerning the suitability of candidates. We feel assured that the project is well past the experimental stage and is a regular feature of our personnel policies.

Continuing evaluation is an essential part of any program and it is our conviction that an evaluation program can be valid only if consumers are involved from the beginning in establishing evaluative criteria and drawing up the evaluation instrument. Again, this year there has been a three part evaluation of the health program with a separate instrument devised for each of the three groups; outpatients, inpatients, and the campus at large. The results have been very helpful in pointing out the weak or objectionable features of the program as well as those areas in which there is broader acceptance. In general, the results show a very satisfying level of acceptance of clinical services and educational programs, while confirming the anxiety we have concerning our inadequacies--most of which are directly related to the crowding resulting from grossly inadequate physical facilities.

As in the past, educational services in the interest of personal and community health have been carried on by a large number of staff members. Several have continued their participation in a residence hall program on an invitational basis, usually presenting a single subject-oriented discussion. These discussions serve several useful purposes. First, they establish a broader range of contact between the professional staff and students than would be possible in the medical or mental health clinics, where contact is primarily on the basis of dis-ease or dis-comfort. Second, they introduce both staff and students to the concept that many topics of popular interest are indeed health related subjects, of interest in common to both staff and students. Furthermore, these programs establish the basis for more serious and better sustained interest in health programs which students initiate and develop largely through their own initiative.

This year there has been more active participation in the honors program with two health related colloquia coordinated by the mental health staff, two by the health education staff, and three by students under the supervision of the health educator. In addition, the health education center has become better established as a source of information for the entire campus on a wide variety of health subjects. There has been a considerable increase in the dissemination of written material and in consultation by staff members with students working on health related projects.

Involvement in in-service education has been sporadic but still effective. A series of noon hour films have been scheduled and the health education staff has been active in planning and leading discussions during intersession and end-of-the-year staff meetings.

One of the most important activities was the establishment, at the request of the medical staff, of a family planning information and counseling service during the second semester. This was in response to a virtual flood of requests for information, which was inundating the medical staff and clogging the appointment clinic almost to the exclusion of other problems. The result was a daily group information and counseling session which proved very successful. It not only relieved physicians of a considerable and time-consuming clinical burden but also probably provided a medium for even better dissemination of information and discussion through the dynamics of this small group. We realize that we are in the midst of a profound change in behavior patterns and that new methods of providing information and services will be necessary if we are to keep up with legitimate demands. It is in this area that we eagerly seek advice from students concerning the manner in which services should be rendered and supported.

Another outstanding development of this department has been the Peer Sex Education program described in Section VII.

Likewise, the Room-to-Move student drug center, to which the health education department has made considerable contribution, is described in Section VII.

The staff continues deeply interested and eager to cooperate in training programs for heads of residence, student counselors, and the entire summer counseling staff. With the reorganization of the Student Affairs administrative unit, it appears that the time is right to establish closer coordination among the various helping services on campus and to begin the development of incisive, thoughtful, and well-supported programs which will help to create a multitude of opportunities for students to enjoy a more satisfying life. We believe that robust health, physical, emotional, and social, will come about through a total commitment of all members of the community to making this a more habitable, more humane, and more sensitive climate in which to live and work. It is an effort in which we shall either all succeed or all fail. No element of the entire enterprise is more important than those dedicated to creative personal and community living. We are incredibly fortunate to have Mrs. Jane Zapka guiding this activity with such perception, diligence, and effectiveness. She, Mrs. Ann Grose, and Mrs. Karen Beauvais, the student health education aide, make a very effective team which is having a tremendous impact on the University community.

One of our highest priorities is to add another equally competent staff member so that the program can be expanded in response to the many demands. An important additional project for the future will be to establish the Health Services as a field training base for Public Health graduate students. Hopefully, this will provide mutual reinforcement to both our department and the Department of Public Health in community health education.

I. Environmental Health and Safety

The Division of Environmental Health and Safety made a great step forward during the past year with the appointment of Mr. Robert P. Gleason as its full-time director. For the first time, the primary energies of the director were focused upon the environmental health and safety problems which have become increasingly diverse and severe with progressive concentration of the campus population. As yet, the program for environmental health and safety is distinctly "informal". This is a condition which is not entirely unintentional, since the confidence of students, faculty, and staff in the program will be a large determinant of its acceptance

and effectiveness. The immediate aim of the program is to provide visibility without threat and credibility without suspicion. Once visibility and credibility have been established, program development should be much more effective.

In the area of general safety, some effort has been directed to the compilation and analysis of student and employee injuries. Although past experience has led us to believe that the increase of student injuries has been roughly proportionate to the increase in population, there have been no firm statistics by which experience could be classified or rated, as is done in long established industrial safety programs. Likewise, it has not been possible to detect trends or patterns which might suggest serious safety hazards. From preliminary estimates, it appears that injuries for the year 1970-71 have declined. Analysis of the injuries shows that almost half of the student injuries occur as a result of "daily living", with an additional one-quarter resulting from "recreational activity". From these data it could be inferred that the problem of injuries is predominantly one of attitude and understanding rather than an unsafe environment. Fortunately, injuries in academic pursuits (instruction, laboratory, etc.) have been less than 5% of the total, but interpretation of this information is debatable as being related to low exposure, good safety instruction, or good defense mechanisms of students. Our main project in this area for the next year will be to attempt a clearer definition of student injury characteristics.

In the case of employee injuries, Workmen's Compensation cases are reviewed for trends and for corrective action, but the basic information supplied is far too scanty and the results too meager to hope to identify problem areas. It is hoped that in the future we may have the benefit of more complete reporting of employee accidents in order to assist with this analysis.

Two pieces of equipment have been obtained during the year for the detection of hazardous gases and vapors, and already they have been useful in specific problems with mercury, carbon monoxide, and xylene. In addition, significant progress has been made in developing a system for the safe disposal of chemical wastes.

In the area of fire safety, the picture also is unclear. The number of fires reported for the year has been less than formerly, but is very difficult to be confident that the reporting of all fires is inherently reliable. Experience in terms of severity of fires has been good, but this may be more fortuitous than the result of good control in view of the proliferation of hot plates in residence halls, leading to increased exposures and many potential problems.

After a very long delay, better facilities have been obtained for servicing of fire extinguishers. There has been additional delay in fitting the shop properly but additional student employment helped to offset the temporary loss of facilities to meet the increased work load, resulting from the construction of new buildings. The problem of capricious discharge of fire extinguishers has decreased appreciably during the past year.

Considerable emphasis has been given to improving channels of communication and coordination with individuals and with organizations on campus concerning problems of fire safety, notably with Physical Plant, Department Safety Committees, the Department of Public Safety, and the Amherst Fire Department. Some progress has been made in improving the flammable liquid storage, with the activation of the chemical storage depot. Most science areas have been surveyed and have shown improvement in methods of handling flammable liquids. Several encouraging fire protection training sessions were held for operating departments.

The fire drill program for the residence halls must be considered far less than successful although a training program was held for University Volunteer Fire Department personnel who conducted drills and seminars in each of the residence halls in early October; evacuation drills were held only in three residence halls. There has been additional activity in publicizing emergency evacuation procedures and the change of the emergency call number from "Operator" to "5-2111".

Fire inspections were made of all campus buildings and all fraternities and sororities at least once during the year, with some buildings receiving more than one visit. Reports and recommendations were issued when necessary. Considerable work remains to be done to make all of the buildings meet satisfactory standards.

The radiation protection activity remains at a high level, spurred by the directives of the AEC. During the past year, additional radiation monitoring and detecting equipment has been acquired, making it possible to utilize Mr. Stryker's talents and implementing a most effective radiation safety program. The computer program planned for defining the status of the some 300 sources of radioisotopes held by over 40 users on campus is in the final states of shakedown and should be operational in the near future. The biggest project for this year was the installation of a 50,000 curie source of Cobalt-60 for irradiation experiments at Agricultural Engineering. The installation was made with recommendations by Environmental Health and Safety for efficient, practical, and dependable measures of safety and security control. The nature of the installation has necessitated several educational/training sessions designed primarily for clarifying emergency procedures based upon understanding the nature of radioactivity. The demands for radioisotope control and for x-radiation control from diffraction equipment and electron microscopes on campus have precluded any significant work in the investigation of the use of lasers.

The problem of pets in residence halls continues to be a significant one in spite of efforts to publicize the undesirable consequences of keeping animals in crowded human habitations. The affirmation by the University Health Council of the prohibition against pets in residence halls and the decision of the General Court of the Student Judiciary to uphold the rule on the basis of a student complaint against one dog owner have been progressive actions in support of the basic regulations. For 1971-72 it is planned to institute a coordinated program to eliminate this nuisance. The program will begin with the inclusion of a clause in the contract of the heads of residence prohibiting keeping pets in residence halls and a letter to all returning students warning of strict enforcement. There is a determination to apprehend and remove animals as soon as they arrive on campus. Explorations are underway with one residence hall to attempt having a small number of specified pets to be maintained under close supervision.

In the fall of 1970, 38 athletes reported cases of gastroenteritis. Although food was initially suspected, tests of food and food histories did not implicate any specific product, and attention was directed to the water system at the athletic field where testing revealed an unsatisfactory water supply. From further investigation, it appeared that the episode occurred from a coincidental breakdown in the system chlorinator and possible back siphonage through an underground hydrant temporarily used as a drinking water source. The recommended installation of a separate potable water supply line with drinking fountains is to be carried out during the summer.

Kitchenettes in residence halls were inspected throughout the year and several were recommended for closing after warnings of unsanitary conditions went unheeded.

The milk sampling program from vending machines and snack bars was also continued and no major bacteriological problems were encountered. A water sampling program was initiated on campus with analyses being done by the Environmental Health Division of the Massachusetts Department of Public Health.

A new feature of food services on campus was the re-opening of Butterfield Dining Commons, operated by students with the support of the University Food Services. A few problems of a minor nature arose which were due to lack of knowledge of food sanitation on the part of students rather than lack of concern or care. During the coming year, increased activity is planned with fraternities in order to eliminate some of the undesirable features of living conditions.

The major objective for 1971-72 will be to formalize the Environmental Health and Safety program through the development of a manual consisting of policy, procedures, and advices to assure coordinated effort in approach to the problems of general safety, fire safety, radiation, and environmental health in all campus activity is expected especially in educational and training aspects in each of the four fields of endeavor. Although the scope of specific programs will not be expanded appreciably, efforts will be directed toward closer and more responsive relationships with the "line" organizations of the Amherst campus.

J. Secretarial Services

The secretarial services were reorganized during the year with one person assigned to handling the Environmental Health and Safety and Health Education departments; a secretary was added to the Director's Office to handle appointments, communications, and typing for the Director; and one secretary was located in the Business Office to handle student insurance, billing, and duplicating. These changes were well received by all involved and proved to be very helpful.

In January, a dial dictation system was installed, allowing dictation directly into units located in the secretarial area from any phone in the Infirmary. We noticed initially a moderate decrease in the amount of dictation since the installation of the system. This appears to be due to the problems encountered with the system when it was first implemented, and seems not to have been sustained.

The output and quality of the work of the girls in the main secretarial pool continues to be outstanding when one considers the "makeshift office" they have been working from for the past few years. Since this "office" was constructed from moveable half-walls located in the middle of a busy corridor, these girls have been constantly subjected to noise, improper ventilation, poor lighting, constant interruptions of idle conversations from fellow employees, and requests for information and directions from strangers. These girls should be commended for their work under these difficult conditions. Lack of space is still the most critical problem in the secretarial service.

For the future, the secretarial service is investigating the rental of two magnetic tape Selectric typewriters rather than one. Two secretaries would be assigned to these and would use them at all times rather than their regular typewriters. By using these machines in this manner, it would be possible to use the machines for the purpose which they were intended and thereby save a tremendous amount of secretarial time. We are also considering changing from a tape-type machine to a card-type machine which would seem to serve our purpose much more efficiently.

The resignation of Marian Panto will leave a gap in the leadership of the secretarial services. Unquestionably the services have grown and developed under her excellent supervision and leadership. She will be missed by all. This gap will require some reorganization during the coming year in order to continue to provide the same high quality services we have now taken for granted.

K. Dietary Services

During the past year the dietary services has continued to provide excellent meals to inpatients and to selected outpatients on special diets. The use of new convenience foods has continued to expand with generally favorable acceptance. The need for more adequate freezer space continues to be a deterrent to expansion of this method of preparing meals. Once again we must mention that the kitchen area continues to have a serious problem with workers trying to function in unreasonably high temperatures during the summer months. (In the past temperatures as high as 110° have been recorded.) A request for consideration of unit air conditioners has been forwarded to the University's planning office and there is hope that this request can be accommodated during the next academic year.

L. Housekeeping Services

The housekeeping and maintenance services continue to maintain their high standard of cleanliness which has been noted year after year. The staff continues to keep up to date in the latest techniques in bacteria control and have a staff morale which is worthy of emulation.

The removal of the mental health services from Brooks to Machmer presented a severe hardship to the housekeeping staff throughout the academic year. This move resulted in a drastically reducing the number of times the mental health offices could be cleaned and caused considerable difficulty in meeting the other demands of an active health services operation.

The maintenance of the over-crowded and highly-used facilities presented many problems this past year for the housekeeping staff. There were times when it was difficult to keep up with the accumulation of dirt brought in by the traffic which began early in the morning and continued through late in the evening. The staff should be commended for their devotion to maintaining the Infirmary building environmentally safe and clean during these trying times.

M. Business Services

The business office continued to meet the enormous demands placed upon them during the past academic year. The personal devotion and willingness to work long hours have allowed them to accommodate 50% more work during the past academic year with only a 25% increase in staff. This department, which had been over-burdened previously has done wonders to meet the payroll regularly and to purchase and provide supplies and equipment when needed with a minimum inconvenience to the other 130 staff members within the Health Services.

A comprehensive cost accounting system was instituted in conjunction with 11 other university health services throughout the country as a part of the American College Health Association sponsored project on uniform cost reporting. This

system has proven to be very useful in defining the cost of operations of the various Health Services activities. This system will be used as a basis for collecting payment from third party providers as well as for managerial decision making at the departmental level. The comparative reports for the 11 other institutions indicates that the University of Massachusetts Health Services has been able to provide high quality comprehensive services to a growing student body within costs that are comparable with the median of the 11 participating institutions. This unquestionably is a significant accomplishment since the level of services provided is well above the median of other institutions.

The storeroom and materials management system under the direction of Mr. Kliska has continued to provide an orderly inventory and distribution system for the entire Health Services. Mr. Kliska's personal devotion to the cost reporting system has proven to be invaluable during the past year. Also his diligence in the area of monitoring the loan equipment for crutches, bedboards, and etc., has made a significant improvement in a previously difficult problem of getting students to return equipment when it was no longer needed. Solution to this problem is noteworthy.

N. Personnel

The Health Services has witnessed a number of retirements after long years of devoted service to the Health Services. This year both Mrs. Katherine Heath and Mrs. Esther Cornish retired from the nursing staff after devoting an aggregate 36 years of service to the students at the University of Massachusetts. Both of these women, who are outstanding individuals and fine nurses, will be missed by staff and students alike.

Under the leadership of Mrs. Dorothy Burroughs representative staffs from each department and division of the Health Services came together to form a social committee to organize the method of expressing appreciation to staff members who may be retiring or resigning from the Health Services. This committee organized a number of parties and activities throughout the year. The success of their activities was repeatedly witnessed by the high attendance. A special word of accommodation should be extended to all staff members, and especially to Mrs. Burroughs, for their work in this important activity.

The suggestion box continued to be active during the last year with numerous suggestions received and acted upon. Reorganization of the parking spaces surrounding the Infirmary, the graveling of the parking area directly in front of the Infirmary, and the installation of more and improved directional signs are all direct results of staff suggestions. Even the formation and implementation of the social committee was a direct result of a suggestion from a number of staff members. The fact that the number of suggestions have dropped off during the last six months may indicate the increased satisfaction with the working conditions at the Health Services

VII. SPECIAL PROJECTS

A. Health Education

Begun in 1969-70, the Peer Sex Education program has developed into a conceptually sound and operationally effective project. Carrying on with last year's original goal of developing a capacity among interested students for working with other students in an educational, counseling, and supportive role, PSE has expanded to involve representative students from each of the residence halls in the Southwest Area. Important developments during the year have been the formation of a PSE Advisory Committee, development of a more formal training program, a decision to establish a stipend for PSE counselors, and beginning plans for program evaluation.

The Advisory Committee, comprising two health educators from the Health Education Division, one member of the Mental Health staff, one Community Development staff trainer, and two students (both participants in the PSE pilot program), has been responsible for the selection of counselors, development of curriculum, and determination of evaluative criteria and procedures. This committee has continued to work effectively throughout the year, particularly in modifying the curriculum in response to changing needs and influences of students.

Recruiting was aimed at appointing one PSE counselor for each of the 24 residence halls in Southwest. Candidates were sought through general publicity in the residence halls and through the active participation of heads of residence, among whom there was widely variable enthusiasm. Candidates were screened by the head of residence of the prospective housing unit and a member of the Advisory Committe, with selection being based upon an awareness of vital campus issues, ability to communicate effectively with others, empathy with the needs of others, and flexibility in dealing with a broad spectrum of ideas and beliefs.

Through the efforts of the Advisory Committee, the training program, coordinated by the two health educators, was offered as a three-credit course in the Department of Public Health. Meeting once a week for three hours, the class had a rigorous course in human sexuality, with some emphasis upon educational methods, group dynamics, and counseling skills. Each student completed a project of his own selection, such as investigation of topics of special interest, design and administration of attitude and information surveys, and the preparation of tapes or other audiovisual material. Achieving a balance among content, educational techniques, and group dynamics and counseling skills has been a continuous challenge to both the staff and the students.

A basic aim has been to prepare the PSE counselor as a readily available source of accurate information and as a catalyst for constructive attitude and behavior change among students. Throughout the program an attempt has been made to create an image of healthy sexuality as a valued aspect throughout life and to increase the awareness of helping resources both at the University and in the larger community. Education for healthful personal and community living is a commitment to a way of life which must be more than subject- or task-oriented. The PSE program is seen, therefore, as one means of helping students establish a respect for life and its multitude of developmental opportunities and to build individual and social value systems around the essential care of human interrelationship.

Next year, PSE counselors will be expected to devise their own programs in their respective residence halls in response to student needs and interests. A variety of resources will be made available to them, and periodic conferences will

be held as a means of exchanging information and improving the program. Students in the Southwest Area have expressed firm support for the program, even to the extent of allocating from student funds the proposed stipend of $25 per month for each of the PSE counselors.

The most important new task facing the program is that of evaluation. Since the effectiveness of an educational program in health can be measured only in terms of modified attitude or behavior, construction of an evaluative process in a very mobile, closely interrelated community of active young adults is extremely difficult. We look forward to active cooperation among the health educators, students, members of the Mental Health staff, Counseling Center, and CDHR to create a realistic, sensitive, and practical evaluation procedure.

In summary, we are excited by the success of the initial steps in the development of the PSE program, convinced that it represents an important and viable model for health education. By any measurement it appears to be one of the most significant activities of the entire health program. Its success is a tribute to the imagination, energy, and skill of Mrs. Jane Zapka, the Health Educator, who has worked tirelessly to gain the active cooperation of those whose contributions have made its early success possible. It is a model demonstration of community action in the area of health education.

Room-To-Move, the student-operated drug information and counseling center, is another example of an outstanding community action program, in this case one which was generated primarily by students and which has matured through patient, active cooperation among several administrative units. Generated two years ago from the concern of a handful of students and a head of residence, it has become not only a model of effectiveness in the immediate institutional community, but also a source of guidance for many other embryonic drug education programs in nearby schools and colleges.

After a year of staff training and accumulation of resources, Room-To-Move opened its doors for official activity during the spring of 1970. The coincidence of the student "strike" provided an unexpected opportunity for the group to demonstrate its effectiveness in working with a wide variety of students from the counterculture.

This academic year began with a small, coherent, well-trained staff of students working under the guidance of Mr. Ronald LaFrance, a doctoral candidate and part-time staff member of the Health Education Division. Support for the center had been gained through a combination of funds from the Student Senate, an allocation from the Provost's Office (via the office of the Dean of Students), and resources from the Counseling Center. In addition, valuable contributions were made to the staff training program through continuing efforts on the part of members of the staff of the Mental Health Division, the Counseling Center, CDHR, the Health Education Division, and others. Although operation of the drop-in center was the specific activity around which most student interest centered at the beginning, there has been increasing interest during the year on the direct educational and counseling aspects of drug education. To this end, the student staff was augmented during the first semester by the acceptance of an additional 25 student staff members, an increment of approximately twice the existing staff. The integration of this group into the training group extended the original staff to its utmost during the first semester and made possible relatively little service beyond the operation of the drop-in center. Although traumatic, the integration was successful, and now the expanded group has diversified its activities, with some interested primarily in on-campus education, others in counseling, and still others in community liaison.

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A basic aim has been to prepare the PSE counselor as a readily available source of accurate information and as a catalyst for constructive attitude and behavior change among students. Throughout the program an attempt has been made to create an image of healthy sexuality as a valued aspect throughout life and to increase the awareness of helping resources both at the University and in the larger community. Education for healthful personal and community living is a commitment to a way of life which must be more than subject- or task-oriented. The PSE program is seen, therefore, as one means of helping students establish a respect for life and its multitude of developmental opportunities and to build individual and social value systems around the essential care of human interrelationship.

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Room-To-Move, the student-operated drug information and counseling center, is another example of an outstanding community action program, in this case one which was generated primarily by students and which has matured through patient, active cooperation among several administrative units. Generated two years ago from the concern of a handful of students and a head of residence, it has become not only a model of effectiveness in the immediate institutional community, but also a source of guidance for many other embryonic drug education programs in nearby schools and colleges.

After a year of staff training and accumulation of resources, Room-To-Move opened its doors for official activity during the spring of 1970. The coincidence of the student "strike" provided an unexpected opportunity for the group to demonstrate its effectiveness in working with a wide variety of students from the counterculture.

This academic year began with a small, coherent, well-trained staff of students working under the guidance of Mr. Ronald LaFrance, a doctoral candidate and part-time staff member of the Health Education Division. Support for the center had been gained through a combination of funds from the Student Senate, an allocation from the Provost's Office (via the office of the Dean of Students), and resources from the Counseling Center. In addition, valuable contributions were made to the staff training program through continuing efforts on the part of members of the staff of the Mental Health Division, the Counseling Center, CDHR, the Health Education Division, and others. Although operation of the drop-in center was the specific activity around which most student interest centered at the beginning, there has been increasing interest during the year on the direct educational and counseling aspects of drug education. To this end, the student staff was augmented during the first semester by the acceptance of an additional 25 student staff members, an increment of approximately twice the existing staff. The integration of this group into the training group extended the original staff to its utmost during the first semester and made possible relatively little service beyond the operation of the drop-in center. Although traumatic, the integration was successful, and now the expanded group has diversified its activities, with some interested primarily in on-campus education, others in counseling, and still others in community liaison.

Experience this year suggests that Room-To-Move may be the one health educational program from which there has been an immediate payoff in reduced incidence of disability. Although the recorded number of students admitted to the inpatient area for drug-related intoxication is increased over last year, we believe this is a result of more accurate reporting. It is the unmistakable impression of all members of the staff that the number of students who have reported to the Health Service during the past year for "bad trips" has decreased materially. One important feature of this decrease has been the excellent rapport between the medical staff of the Health Services and the student staff of Room-To-Move. When a student has come or been brought to the Infirmary with a "bad trip", it has become our almost invariable procedure to call a member of Room-To-Move to come to the Infirmary to sit with the patient, or even to take him to the drop-in center. Although we have no firm data to support this opinion, we believe that patients who are having hallucinatory and other undesirable drugs effects are better treated by the patients' discussion with their peers than with the prompt use of medication.

Another especially valuable by-product of the student drug program has been its impact upon in-service education of the medical and nursing staffs of the Health Services. The exchange has worked both ways, with students meeting with professional staff members and nurses and physicians participating in Room-To-Move training sessions. The result has been more effective communication and much closer mutual understanding. The entire institutional community has benefitted.

For those who would develop a student-operated drug information and counseling center in this model, one caution is in order. This is a project which must be student-centered, student-energized, and student-directed. The support of professionals is important, but the manner in which the support is offered is critical. This program must develop in response to student perception of need, student generation of activity, and student guidance of direction. Perception, guidance, and direction can be assisted materially by the patient and sensitive assistance of capable professionals who can live with the agonizing, slow progress of student deliberations. In the end, however, the results more than repay the investment of energy and trust in the student project.

It is a source of considerable satisfaction to all who have been involved in this project to note that Room-To-Move has been awarded a $37,000 contract from HEW to continue and expand its work during the coming year. Although this is a project which received its primary motivation outside the Health Services, it is one with which we have been closely associated since its inception. It is an association which we support without reservation and one in which we have unmixed pride for its remarkable progress. Its development is a reflection not only of student energy but also the unending patience, sensitivity, and faith in students exhibited by Mr. Ronald LaFrance.

B. Nurse Practitioner Clinic

One of the chief tasks in developing a comprehensive and efficient health delivery system is defining the roles of health workers so that each has an opportunity to provide those services for which he is best prepared on the basis of education and experience. In the interest of both the entire system and the personal satisfaction of workers it is important that each worker have an opportunity of making a contribution which is near the limit of his capability and that the work of each be planned and coordinated so that all services fit into a pattern through which all the consumers of services will be able to have their needs met promptly, efficiently, and with high quality care.

In a high volume outpatient clinic in which a large percentage of walk-in patients must be accepted, there are at least three consistent problems which must be solved before the clinic can be successful. First, there must be a "triage" system through which more seriously ill patients can be identified and assured of priority treatment. Second, there should be some means of identifying those walk-in patients whose needs can be met either through special services or by very brief treatment so they may be taken out of the main OPD line and reduce blocking time for the remainder. Third, roles and tasks should be reassigned so that nurses are trained and given an opportunity to function near the limit of their capability and physicians are utilized primarily for those services which only physicians can provide.

In preparation for this year, it was decided to establish a formal Nurse-Practitioner (N-P) Clinic in order to attempt solutions to these problems in a more systematic manner than had been done previously. The goals of the clinic were established as (a) facilitating in the care of outpatients by promoting optimum use of personnel and space, (b) preventing more serious illness by making health information and effective early care readily available under circumstances which will promote optimum use, (c) upgrading the clinical skills of selected nurses assigned to work in the clinic, (d) increasing staff satisfaction by encouraging optimum use of clinical skills, (e) increasing the efficiency of outpatient services by promoting efficient use of resources, and (f) increasing patient satisfaction by providing high quality care within a reasonable period of time. The primary service functions of the clinic were seen as: (a) sorting arriving patients through brief evaluation in order to estimate the urgency of need, and (b) providing primary care for patients having a limited range of clinic problems for which it is unlikely physician evaluation will be needed.

The proposed clinic model was to have four nurse practitioners working as a unit in the outpatient clinic, under the direct supervision at all times of a physician whose primary function would be to supervise and support the work of the nurse practitioners. A basic group of five nurses, each of whom had demonstrated above average ability in clinical skills and had a specific interest in the project, were selected for an intensive two-week period of training prior to the beginning of the school year. During this time, these eager young women quickly demonstrated their ability to learn and use new skills based upon their previous clinical experience and systematized instruction, including lectures, discussions, and the review of an impressive clinical manual.

The physician supervision of the clinic was confined to three members of the medical staff, in rotation, in order to minimize the individual differences in guidance and work habits, which could have been very discouraging or disruptive to the work pattern.

In general, experience with the N-P clinic has been excellent. Over half of the patients coming to the OPD (walk-in plus appointment) have been seen in the clinic. Of these, 85% have been accommodated totally within the clinic; only 15% were referred either for additional work-up or admission to the inpatient service. The physicians serving as consultant to the nurses were able to see more patients than physicians working outside the N-P clinic. A formal evaluation of services confirmed the impression that nurses were providing a high quality of care for the conditions they were accepting for treatment. Furthermore, they used excellent judgement in seeking laboratory or x-ray support, and their documentation of diagnosis and treatment was substantially superior to that of physicians for comparable conditions. Patients surveyed were almost unanimous in reflecting satisfaction

with the manner in which they were received and the care offered by nurses in the N-P clinic.

There have been problems, as would be expected with a new venture, but none seem insoluble. As their competence has increased there has been a tendency of the nurses in the N-P clinic to accept more complicated clinical problems. The resulting increased call for physician consultation has often exceeded the limits of a single physician. The result has been an increase in blocking time in the N-P clinic, thus thwarting one of its main objectives, that of expediting the passage of patients through the clinic. Scheduling has been so tight there has been inadequate time for supplementary educational sessions and communication with the physicians in the general OPD has been less than optimum. Turnover among nurses creates one of the most severe problems, in view of the considerable investment of time necessary to prepare nurses for this special responsibility. None of these problems, however, is insoluble. In general, the experience during the first year has been highly encouraging and development of the concept will be continued in the future. The success of the clinic is a tribute to the imagination, energy, and effectiveness of Dr. McBride who, with the able assistance of Dr. Reichert, invested a tremendous amount of time in the development of the educational program and, with Drs. Chittum and Ralph, served as supervisor or consultant for the program throughout the year.

C. Research and Design of a New Approach to Delivery of Outpatient Clinical Services

The Health Services, in cooperation with the Departments of Industrial Engineering and Sociology developed, over the past year and a half, an outpatient system designed to meet the needs of both the consumers and providers of services, making full use of the limited physical as well as financial resources. The design of the new system began with the study of the returns from student questionnaires completed in December 1968 and February 1970, which asked students to evaluate the care received from the health program. These surveys reflected general satisfaction with the quality of care but noted that waiting time was unreasonable. The surveys reported, furthermore, that over 80% of the respondents preferred to see a physician by appointment and that only 16% indicated they would be object to seeing a health professional other than the physician, such as a nurse or medical corpsman. Additional data concerning patient waiting times and physician service times were gathered by the operations research staff.

From the automated information recording and retrieval system, used to gather data concerning outpatient service for the past two years, it was possible to make an extensive analysis of patient arrival times over the past two years. This data was used by Professor Rising and Mr. Baron, a graduate student in Industrial Engineering, to develop a computer simulation model that mirrored the operation of the existing outpatient clinic. As the model was validated it gave credibility to the idea that an outpatient system could be described mathematically and simulated on a computer.

With this model changes in the present system could be simulated and an estimate made of their effect on patient waiting time, physician idle time, and length of physician work day without resorting to the cumbersome trial-and-error method normally used. One additional important key to the success of the trial was a series of interviews with each member of the medical staff and a series of interdisciplinary group meetings through which it was possible to review all of the data, discuss the staff satisfaction with the recommendations, and agree to a unified trial of the new system.

The following innovations were attempted:

1. An improved physician scheduling strategy was developed which made appointments available in a number which was the reciprocal of the walk-in patients anticipated daily. The primary aim of this strategy was to achieve as much load-leveling as possible assuming this could be managed more readily and would be both more efficient and more acceptable to the staff than manipulating a complex staff scheduling system to fit divergent patient arrival rates. This new scheduling strategy increased the number of prescheduled appointments by 40%. The personalized appointments were scheduled at 20 minute intervals, a period shorter than the observed service time for appointment patients, thus allowing all physicians to see both appointment and walk-in patients throughout the day. By having walk-in patients available for interdigitation with appointment patients this strategy also compensated for no-show problems experienced in other studies.

A signaling system was developed by which physician aides could notify the scheduling desk when the physician was ready for the next patient, thus eliminating a number of serious communication problems which had compromised seriously similar scheduling attempts.

2. The nurse practitioner clinic was established, as outlined above. This contributed materially to maintaining a rapid flow of patients with minor medical complaints and helped somewhat to "triage" patients with more serious problems.

3. The third innovation was the development of a computer based appointment system through which students were able to make personalized appointments either by phone or in person at the appointment desk. The by-products of the automated appointment system were development of a master roster for the scheduling desk, an alphabetized listing for retrieval of records, and an appointment reminder card which was sent automatically within a few days of the student's appointment.

The impact on staff morale of the changes in the operation of the clinic were studied by two sociologists who conducted interviews with each medical staff member both before and after trial of the revised system. It was found that the staff had a high level of confidence in the new system and believed that it probably helped materially to avoid a more catastrophic situation, which would have occurred had the clinic experienced the same rate of increase using the old system. Furthermore, physicians felt comfortable that the new system allowed them more time to concentrate on providing first-rate medical care rather than having to deal with irate student complaints resulting from excessive waiting times.

The results of the study indicated that the number of patients seen by physicians during the year increased by 13% with a corresponding decrease of 5% in the number of physician hours allocated to seeing patients. This was accomplished without an appreciable change in the overall waiting time, which remained constant before and after implementation of the new system. In addition, interviews with the physicians confirmed the impression that the new system required less overtime to finish treating those patients that remained in the system after clinic hours were closed. Furthermore, a repeat student survey conducted in December 1970 reported the student satisfaction in the Health Services had increased significantly, especially in the confidence level with which students were willing to discuss personal problems with the members of the Health Services staff (an increase of 14% over the previous year). At the same time student dissatisfaction with waiting time actually decreased over the previous year. In conclusion, it was felt by all that the new system was successful in that it made care more accessible to students and increased

satisfaction with the services provided from the point of view of both staff and students. The fact that this was accomplished without increasing the cost of the clinic operation or adding personnel makes this new system a significant contribution in the area of outpatient care. In essence it is an example of the close cooperation of management techniques and services in the organization and presentation of professional care. Unfortunately, the constraints of the severely limited facilities prevented the system from realizing its full potential.

Another significant conclusion of the study was the observation that physician productivity can be increased substantially by making better use of clinic time to improve scheduling strategies. It suggested also that nurse practitioners can relieve physicians of the burden of seeing many patients with minor complaints without jeopardizing the quality of care provided. These two achievements could have considerable impact on the future of the health care delivery systems in this country.

Finally, the study demonstrated that this methodology, which introduces into the clinic management process improved structure and planning with increased ability to identify complex problems, has practical value, and that management systems engineering can offer the health field an orderly method for arriving at decisions based on factual and timely data. The simulation model developed during the study will be used during the coming year as an adjunct to decision making. It is expected that this will reduce substantially the risk of disruption to an ongoing clinic which is inherent to the introduction of new ideas on a trial and error basis.

One word of caution is advisable for those interested in pursuing this method of problem solving. Problems can never be solved by machines and systems; they can be solved only by men. If the people involved are not motivated to change or if the use of computer technology in any decision making gives the impression that it is the machine which is making the decisions and the staff are simply tools of the machine, the system will be doomed to failure. Care must be taken to gain the trust and confidence of the entire staff so they feel that they as human beings still have control over their professional lives. This can be accomplished only by a deliberate effort to assure that all decisions, no matter how trivial or mundane, are made with full participation from the entire medical staff. Gaining this level of cooperation is time-consuming but essential. If done effectively the effort will be repaid many times in increased efficiency and staff satisfaction.

D. Automated Intramural Clearance System

The University of Massachusetts has an exceptionally active intramural program with over 7,000 different students participating in several sports activities each year. The Health Services has accepted the responsibility of reviewing the medical histories for these participants on the premise that limiting the participation of those with previous illness or injury might prevent additional difficulty. The rapid growth of the program, however, has created a task which has become almost entirely unmanageable, especially if done manually. As a result, a new procedure has been developed using a self-administered medical history on a machine readable form from which the information can be translated onto a standard IBM card. The card information is processed by programs written in cobalt for an IBM 360-40 computer. The programs scan the information and identify those students who have medical conditions, illness or injury, which should be evaluated prior to participation. In addition, the computer produces team rosters for the intramural athletic department and a listing of students who have potential medical problems to be

evaluated. Students who are designated for further evaluation are not allowed to participate until they have been cleared by a staff physician. In our experience between 5% and 10% of the students are cited for evaluation.

It is expected that the new automated clearing system will save a tremendous amount of secretarial and medical staff time previously used in the tedious and exhausting task of examining large volumes of health folders or health questionnaires. Furthermore, it is expected that the opportunity for human error may be reduced substantially.

Finally, and most important, the automated clearance system achieves a more sophistocated screening procedure by permitting different criteria to be set up for each individual sport. The system is also designed to make possible access to the students entrance medical history and health evaluation data base. This permits a more comprehensive evaluation and allows for the storage of the results of this current evaluation in the student's permanent automated record.

A by-product of the system is the creation of team rosters which was formally a mundane and expensive task necessary for the success of the entire intramural program. Finally, the system should simplify the compilation of records and statistics concerning the intramural program and the health experience of the participants.

E. Hampshire College

One of the problems which plagues all small colleges is the difficulty in developing a health program which will meet the needs of the institution for health education, environmental health and safety surveillance, and assurance of the availability of personal health services. Any small institution which attempts to be self-sufficient runs the double risk of devoting an exorbitant proportion of its resources to the health program and consigning the health professionals to a life of relative isolation. Attempt elsewhere at collaboration among colleges or among professionals in pooling their resources to provide college health programs has met with variable success. The opening of Hampshire College in September of 1970 provided an opportunity to develop a model in the local area.

During the year the first steps of collaboration were taken with an agreement to release Doctor McBride for assumption of duties as the director of Hampshire College's health program on a one-fourth time basis. In addition, it was agreed that health education and environmental health and safety consultation would be available, as well as support services in the areas of laboratory, x-ray, physical therapy, and pharmacy. Doctor Trewartha served as a consultant in the area of mental health.

This arrangement provided Hampshire College with a professional medical staff which it could identify as its own (Doctor McBride) but with additional off-hours back up of our entire system of services for personal care. In addition, there was the benefit of consultation in the areas of community health not directly related to personal care. This service to Hampshire College was contracted on a prepayment basis, except for the purchase of inpatient care and laboratory, x-ray, and pharmacy services on a fee-for-service basis. The arrangement seems to have been highly satisfactory.

Plans for next year include the assignment of two physicians, each on a one-fourth time basis, expanding the service but maintaining the identity of those professionals working with Hampshire College. Support services, including inpatient care, now will be included in an over-all fee; negotiations are underway to include full mental health coverage from our staff. The result of this collaboration will be a far more comprehensive health program than Hampshire College could have afforded working independently. We feel, for example, that this arrangement is definitely superior to contracting with a local medical group for personal care, seeking mental health services from another source, and being dependent upon commercial laboratories and pharmacies. One immediate tangible benefit has been the inclusion of Hampshire College students in the University of Massachusetts supplementary student insurance group with sufficient premium savings to support a major part of the remainder of the health program.

This collaborative effort has been so successful that preliminary discussions are underway with Amherst College to consider inclusion of that institution in a three college collaboration at some time in the near future. We look forward to exploring with Mt. Holyoke and Smith Colleges the possibility of at least limited collaboration among all of the five institutions in the Valley. This is clearly consistent with the development of better coordinated health delivery systems, a trend which may be accelorated for institutions who are impressed with the inefficency, and possible ineffectiveness, of individual small health programs.

F. Medical School Collaboration

During the several years of indecision concerning the formation and location of the School of Medicine, there has been considerable speculation and anticipation among our staff about the possibility of collaboration with the School when (or if) it got started. With the entrance of the first class of 16 students in September 1970 this collaboration became a real possibility. This year we were fortunate in being selected as one of the sites for a two week field experience in community health for one of the first year students, Mr. Gary Wenzelberg. Having this eager young man (a graduate of the University of Massachusetts) and a colleague from Hampshire College with us was an invigorating experience. During this brief period they became acquainted not only with the internal operation of the Health Services unit but also with its relationship to the rest of the institutional community. They also participated actively in some of the intersession staff meetings. This initial interchange was so successful that we are looking forward eagerly to other areas of collaboration as the School of Medicine develops programs for more advanced students.

VIII. FUTURE NEEDS

Trying to anticipate needs for the immediate and somewhat more distant future, it seems clear that the most important (even if not most pressing) need is for a clarification of the University's posture in the area of health and a delineation of the University Health Services' role in the implementation of long-range goals. These can be clarified with assurance only in relationship to trends and influences outside the University. Looking beyond the University to the national scene, it appears that the health delivery "system" is finally entering a critical stage of metamorphosis. The acceptance by a larger segment of our population that access to good health is a right of every citizen, rather than a privilege for which one bargains on the basis of exchangeable assets, has created a new awareness of need and a more imperative level of demand. Added to this has been a growing recognition that health programs which previously had been centered about remedial care for the ill must reorder their priorities, emphasizing positive programs for the promotion of health. There has been new awareness of the potency of human interaction and the influence of environment as determinants of health or illness. The net effect of these and other related trends has been to increase the effective demand for health services (personal care, education, environmental surveillance, and health promotion), but without increasing proportionately the supply of health workers. The result has been as one might predict. The cost of health delivery has risen more rapidly than any other major component in the economy. The inefficiency inherent in our present disorganization of health care has become more blatantly obvious and the cry for change more imperative.

Our specific needs within the University will depend upon the way in which we perceive our responsibilities and the extent to which we respond to opportunities. We are in a very favorable position to create on campus a prototype of the health delivery system of the future. From the present point of vantage, it seems likely that this system will have many characteristics which now are emerging as definite trends:

1. The historical emphasis upon providing remedial care for individuals will be replaced, or at least supplemented heavily, by emphasis upon programs for the prevention of dis-ease and dis-ability. The exact dimensions of these programs are difficult to predict now, but it seems obvious that there will be greater emphasis upon behavioral problems, both individual and social, as factors in individual and community health. A related byproduct will be closer integration of economic and social factors as determinants of health or illness.

2. There will be even broader acceptance of the premise that every person has an essential right to access to healthful living, not simply a right to bargain for health care. The health of the community will become a sufficiently common concern to assure access to the system by everyone without social or economic constraints. Prepayment will be the order of the day.

3. There will be an increasing scarcity of health workers in many areas. This scarcity may be more apparent than real in some professions because of stereotyped work-roles which proscribe full utilization of the education, training, and inherent capability of many workers. The result will be a redefinition of job-roles in many categories. Progress will be traumatic and irregular, but it must come.

There will be an indeterminant period of intense readjustment, much of it marked by confusion and emotional turmoil. As a major educational institution, the University of Massachusetts has an obligation to participate actively in the resolution of this important problem. To deny this is to consign ourselves to the rear platoon in the parade of change.

In May 1969 the Faculty Senate requested the Chancellor to establish a committee to study the development and extension of the University's health program (otherwise known as the Prepaid Group Practice Committee). Originally conceived as a means of extending to faculty an opportunity for participation in a prepaid group practice for remedial care, this committee made a preliminary report, recommending a feasibility study of a broad health program. The committee now is in the midst of its exploration of both the extent of the program and the means for implementation, with the next report due in December 1971. It is of the greatest importance to all elements of the University community--students, staff, faculty, and their dependents--that this study be supported with sufficient determination to assure a report which is broad in its assessment of problems and opportunities, imaginative in its suggestions for problem-resolution, and bold in its recommendations.

In the meantime, we can predict with assurance some specific needs which will be influenced only in detail as a result of the committee's deliberations:

1. Space. The critical space problem to which reference has been made regularly for at least five years continues, but with real hope for resolution in the future. Final working drawings now are being prepared for the first stage of the addition to the present Health Center, and there is real hope that construction may begin before the end of the calendar year. Unfortunately, we can only expect the problem to become worse in the immediate future, especially from the impact of construction immediately adjacent to the present building. With good fortune, however, this inconvenience will be temporary, and there is a possibility that the first stage of the addition will be ready for occupancy in 1973.

It should be emphasized, however, that this is only the first stage in the addition of facilities which are urgently needed simply to continue our present program for the presently projected student body. If there is any hope of developing a coherent, efficient, and creative program for the future, it is critical that the Mental Health, Environmental Health and Safety, and Health Education Divisions be integrated physically with the rest of the Health Services staff.

It is recommended with great urgency that planning for the second addition proceed with the vigorous support of all levels of the University administration. It should be emphasized that this second stage is in no way dependent upon deliberations of the study committee or decisions made as a result of its report. The present projection for two additions to the Health Center is not predicated upon and will not accommodate any significant expansion of program to include other levels of subscribers. From this it should be clear that there is no real possibility of significant extension of services, especially clinical services, to other elements of the community without provision for additional physical facilities.

2. Support. The major financial support for the University's present health program comes predominantly from the mandatory student health fee. This is not inappropriate in view of the present program emphasis upon providing remedial care (inpatient and outpatient) for students. Having the program for personal services dependent upon student acceptance has some very positive benefits, especially in terms of program planning and quality control. We flourish on a flow of student acceptance and will wither on the vine if this acceptance can't be justified. The present system of group prepayment also is entirely consistent with anticipated changes in the national health delivery system. There seems to be no reason to alter this relationship at present.

Insofar as the program emphasis changes, however, in favor of broader educational and preventive programs, it will become imperative that more support be gained from general University funds, or at least from sources other than student fees. Benefits from the environmental health and safety program accrue to the entire University community; it is no less than appropriate that its support be distributed likewise. Similarly, the benefits of education for personal and community health accrue not only to individuals but to the community as a whole; it is, therefore, no less inappropriate that significant extensions of the health education program be supported by general University funds. It is recommended, therefore, that there be active exploration of means for gaining substantial support for program development from other than student fees.

3. Coordination. With increasing emphasis upon behavioral and environmental influences upon health, it is of increasing importance that there be closer coordination among those administrative units and agencies which are in a position to make positive contributions in this area. Within the University, a step has been taken forward in relating the University Health Services, the Counseling Center, the Community Development and Human Relations Center, and the Career Planning and Placement Service to a single administrative unit. There is no plan at present, nor is there any need in the future, for a loss in the identity of each of these functional units. It is important, however, that the work of each be better coordinated in the interest of individual and community welfare. It is important that this administrative unit be given sufficient support to make possible active development and coordination of its many and valuable resources.

It is important, furthermore, that means be explored for coordination of non-campus resources which can make a positive contribution to the University's health program.

Finally, in keeping not only with the spirit of Five-College cooperation but also the trend of the times, it is recommended that there be continuing vigorous exploration of ways in which there can be close collaboration--even if not integration--among the health programs of the five Valley institutions. If it is impossible for us, with our coincidence of many common interests, to plan and work together, there can be little hope of a system at the national level.

A N N U A L R E P O R T

School of Home Economics
University of Massachusetts

July 1, 1970 - June 30, 1971

Submitted by: Helen G. Canoyer

Helen G. Canoyer, Dean

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Reports of:

The Recruitment Office

Home Economics Extension Division

Dept. of Home Economics Education

Dept. of Human Development

Dept. of Management & Family Economics

Dept. of Nutrition and Food

Dept. of Textiles, Clothing & Environmental Arts

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I. APPROPRIATIONS - SUBSIDIARY ACCOUNT

	Actual 1968-69	Actual 1969-70	Actual 1970-71
01, Salaries - Perm. Pos.	$381,408.	$389,732.	$428,116.66
02, Salaries - Other	36,357.	30,867.	40,100.00
03, Services - Non-Empl.	17,500.	16,000.	10,000.00*
10, Travel	3,000.	3,000.	2,000.00
12, Maint, Reps.,etc.	750.	829.	1,012.00
13, Spec. Sup. & Exps.	9,000	9,500.	9,500.00
14, Off. & Adminis.	1,200.	1,400.	250.00
14[1], Telephone	4,000.	3,200.	3,450.00
15, Equipment	2,117.19	2,000.	2,000.00
16, Rentals	300.	300.	300.00
Totals	$455,632.19	$456,908.	$496,728.66

(*Plus $4000. for the School Study).

II. PERSONNEL

	Sept. 1968	Sept. 1969	Sept. 1970
a. RANK			
Professors	3	1	1
Professors - CAL	3	5	6
Associate Professors	2	2	4
Associate Professors - CAL	7	6	4
Assistant Professors	9	9	9
Assistant Professors - CAL	1	1	0
Instructors	1	3	2
Lecturers	7	7	6
Totals	33	34	32

Other Personnel - Clerical

Champlin, Grace
Choiniere, Kathleen
Greskiewicz, Mrs. Pauline
Handrich, Mrs. Phyllis
Lashway, Mrs. Gertrude
Menard, Mrs. Dorothy E.
Reall, Genevieve
Weaver, Mrs. Charlene

b. FACULTY ON LEAVE

Mrs. Catharine C. Porter (maternity leave)

c. APPOINTMENTS, PROMOTIONS, MERIT INCREASES

Appointments

Virginia Beal - Associate Professor - CAL
Mrs. Jane F. Moser - Lecturer (part time)
Mrs. Clarinda Hankinson - Lecturer (part time)

Merit Increments, Feb. 1971

Dr. Mark H. Bert
Mrs. Ruth C. Boicourt
Joseph D. Burroughs
Dr. Roberta R. Collard
Dr. Verda M. Dale
Dorothy Davis
Virginia Davis
Terrence J. Dumas
Winifred I. Eastwood
Mrs. Helen E. Harvey
Sarah L. Hawes
Mrs. Rosa S. Johnston
Marjorie M. Merchant
Dr. Ellis G. Olin
Dr. Herbert S. Paston
Richard A. Rainsford
Mrs. Margaret Randall
Mrs. Anna S. Russell
Mrs. Marjorie F. Sullivan
Dr. Barbara F. Turner
Helen R. Vaznaian
Harriet J. Wright

Promotions

Mrs. Jane F. McCullough - to Associate Professor
Marjorie H. Merchant to Professor
Dr. Herbert S. Paston - to Associate Professor

Tenure

Dr. Mark H. Bert
Dr. Roberta R. Collard

d. RESIGNATIONS

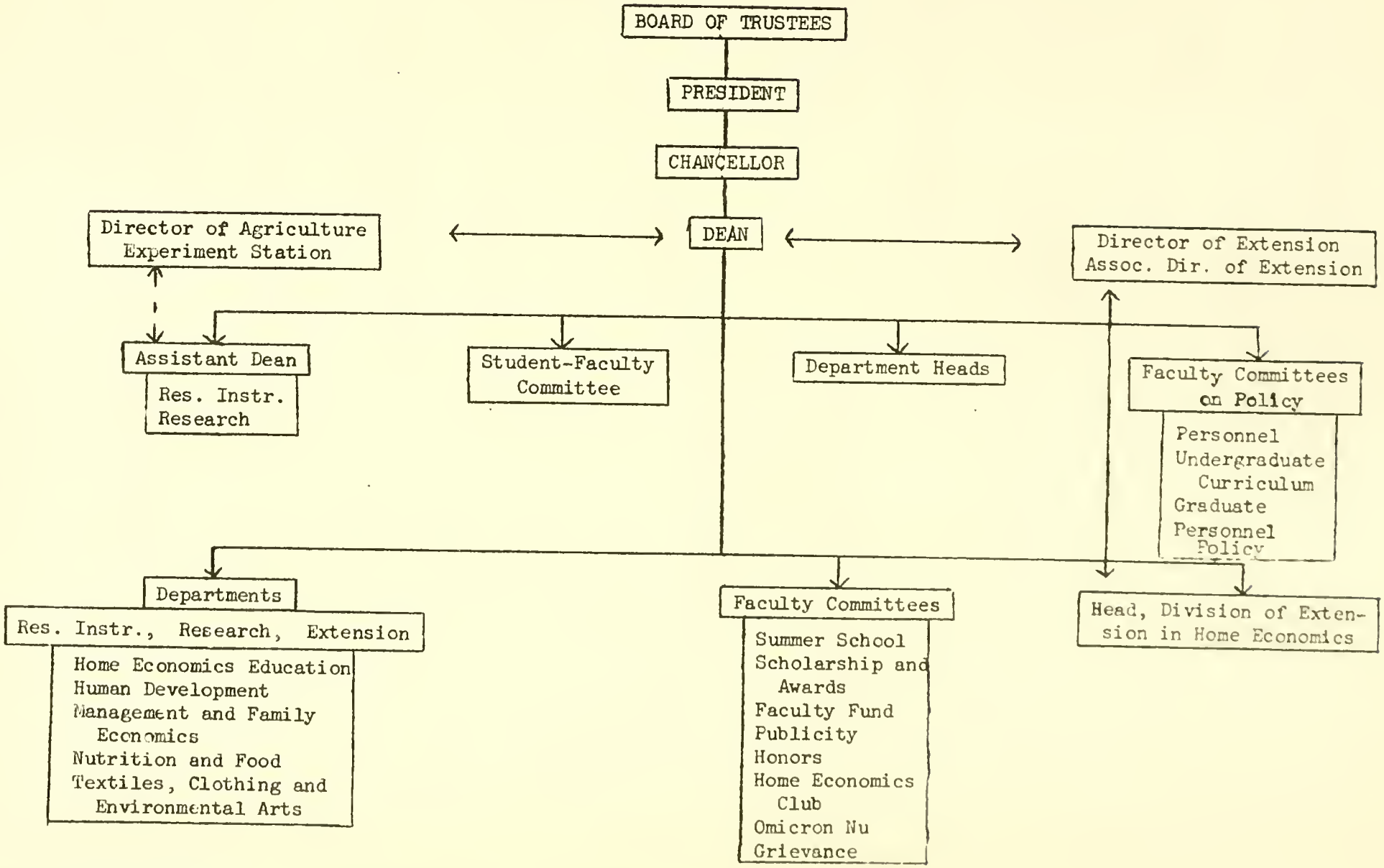
Mrs. Nancy Bender - Lecturer (part time)
Dr. Verda M. Dale

e. RETIREMENTS

None

SCHOOL OF HOME ECONOMICS

III. ORGANIZATION CHART



June 1971:kmc

UNIVERSITY OF MASSACHUSETTS
SCHOOL OF HOME ECONOMICS

ORGANIZATION PATTERN
1970-71

DEAN'S OFFICE

Dean - Dr. Helen G. Canoyer
Assistant Dean - Dr. Christine H. Hillman
Mrs. Ruth C. Boicourt

COOPERATIVE EXTENSION DIVISION

Head - Winifred I. Eastwood
* - Faculty who are also in Cooperative Extension

HOME ECONOMICS EDUCATION

Head - Helen R. Vaznaian
Mrs. Marjorie F. Sullivan

HUMAN DEVELOPMENT

Head - Dr. Ellis G. Olin
*Joseph D. Burroughs
Dr. Grace Craig
Dr. Roberta Collard
Dr. Barbara Turner

Laboratory School Teachers

Mrs. Nancy S. Bender
Terrence J. Dumas
Mrs. Helen E. Harvey
Mrs. R. Navon
Mrs. Anna S. Russell
Mrs. Patricia Willing

MANAGEMENT & FAMILY ECONOMICS

*Head - Dr. Verda M. Dale
*Mrs. Audrey Isles
*Marjorie M. Merchant

NUTRITION AND FOOD

Acting Head - Dr. Christine H. Hillman
Virginia Beal
Dr. Mark H. Bert
Dorothy Davis
Mrs. Clarinda Hankinson (2nd sem.)
Mrs. Jane F. McCullough
Dr. K. Padma Umapathy
*Harriet J. Wright

TEXTILES, CLOTHING & ENVIRONMENTAL ARTS

Head - Sarah L. Hawes
*Virginia Davis
*Mrs. Rosa S. Johnston
Dr. Marion A. Niederpruem
Dr. Herbert S. Paston
Mrs. Catharine Porter (maternity leave, 1970-71)
Richard Rainsford
Mrs. Margaret Randall

Revised 6/10/71;m

SCHOOL OF HOME ECONOMICS

ENROLLMENT BY MAJORS -- MAY 25, 1971

HOME ECONOMICS EDUCATION

Class of 1971	-	20
Class of 1972	-	32
Class of 1973	-	27
Class of 1974	-	32
		111

HUMAN DEVELOPMENT

Class of 1971	-	47
Class of 1972	-	92
Class of 1973	-	168
Class of 1974	-	96
		403

DIETETICS AND INSTITUTIONAL ADMINISTRATION

Class of 1971	-	6
Class of 1972	-	11
Class of 1973	-	9
Class of 1974	-	10
Non-Classified	-	1
		37

FOODS IN BUSINESS

Class of 1971	-	3
Class of 1972	-	0
Class of 1973	-	2
Class of 1974	-	1
		6

TEXTILES, CLOTHING AND ENVIRONMENTAL ARTS

Class of 1971	-	40
Class of 1972	-	38
Class of 1973	-	49
Class of 1974	-	51
Class of 1975	-	1
		179

ENROLLMENT BY MAJORS

Home Economics Education	-	111
Human Development	-	403
Dietetics and Institutional Administration	-	37
Foods in Business	-	6
Textiles, Clothing and Environmental Arts	-	179
TOTAL ENROLLMENT		736

6/4/71:h

SCHOOL OF HOME ECONOMICS UNDERGRADUATE ENROLLMENT

FALL 1961 -- FALL 1969

Fall Semester 1961			
Freshman		-	26
Sophomore		-	34
Junior		-	26
Senior		-	30
	Total		116
Fall Semester 1962		-	
Freshman		-	37
Sophomore		-	32
Junior		-	40
Senior		-	28
	Total		137
Fall Semester 1963			
Freshman		-	62
Sophomore		-	44
Junior		-	35
Senior		-	36
	Total		177
Fall Semester 1964			
Freshman		-	74
Sophomore		-	63
Junior		-	40
Senior		-	33
	Total		213
Fall Semester 1965			
Freshman		-	101
Sophomore		-	94
Junior		-	53
Senior		-	36
Non-Classified		-	5
	Total		289
Fall Semester 1966			
Freshman		-	114
Sophomore		-	111
Junior		-	109
Senior		-	49
Non-Classified		-	4
	Total		387

Fall Semester 1967

Freshman	-	134
Sophomore	-	129
Junior	-	135
Senior	-	99
Non-Classified	-	3
Total		500

Fall Semester 1968

Freshman	-	108
Sophomore	-	165
Junior	-	140
Senior	-	128
Non-Classified	-	2
Total		543

Fall Semester 1969

Freshman	-	99
Sophomore	-	138
Junior	-	137
Senior	-	127
Non-Classified	-	6
Total		507

Fall Semester 1970

Freshman	-	111
Sophomore	-	142
Junior	-	166
Senior	-	133
Non-Classified	-	3
Total		555

Percentage of Increase -- Fall 1961 to Fall 1970 ---------- 378.44%

	Sept. 1968	Sept. 1969	Sept. 1970
Number of Graduate Majors	34	23	40

	1968-1969		1969-1970		1970-1971	
	1st Sem.	2nd Sem.	1st Sem.	2nd Sem.	1st Sem.	2nd Sem.
Number of Students Taught (Undergraduate & Graduate)	1517	1633	1543	1646	1859	2428
Number of Non-Majors Taught	402	451	365	490	649	880

6/4/71:h

VI. MAJOR ACCOMPLISHMENTS

1. As reported in last year's Annual Report, the faculty, students and Dean, with the approval and urging of the President and Provost, undertook to examine the goals of the School of Home Economics and to assess its programs in terms of human needs today and in the foreseeable future. In January 1970, the Chancellor appointed a Study Committee. It was composed of six faculty members, four undergraduates, and one graduate student from the School of Home Economics, and three professors from allied fields in the university. All faculty and students were elected by their peers.

   In addition, seven faculty from other divisions and administration in the University, plus four Extension home economists (county) served as campus consultants". Also, four outstanding leaders from other universities, business and government served as 'working consultants . Several advisers were also called upon for their assistance. This was done in order to further enlarge the input in related fields as well as from Home Economics. A list of the Committee, Consultants and Advisers is included in the Report.

   The Report was completed and submitted to Chancellor Tippo on April 5, 1971. Although it is too long a document to reproduce here, some of the major recommendations should be presented in the School's Annual Report.

   The Committee addressed itself to the historical mission of Home Economics in relation to an assessment of the present situation and to the present status of the Home Economics profession in general. It is clear in those two sections that although the Home Economics profession has studied itself for many years, and although there has been general agreement as to the concept of what Home Economics is and its objectives, there has been considerable disagreement as to how to implement those concepts and objectives. Despite this disagreement among Schools and Colleges of Home Economics nationally, the slow growth in enrollment during the 1950's was dramatically changed during the 60's to a constant increase in enrollment.

   The Study Committee concluded early in its deliberations that there is a place at the University of Massachusetts/ Amherst for a school or college focused on contemporary

social problems affecting the individual, family and community. Home Economics, as traditionally conceived, was concerned primarily with the individual and the family on the farm. Home Economics, therefore, developed in the United States to meet the needs of a predominately rural, widely dispersed population, when only 4% of the college age group attended a college or university. Radical changes in American society in this century and such further changes as can be forecast for the decades ahead, call for a broadening of the field of home economics and an awakening to the contributions it can make in dealing with contemporary social problems affecting the individual family and community.

American society today is overhelmingly urban and industrialized. Some 40% of the college age group are enrolled in college or university. Community and government agencies to an increasing extent are undertaking functions handled in the past by the family unit. Although the American population has trebled since 1900, the isolation of the individual has become critical. Rapid technological development, population growth and urbanization have been accompanied by such problems as rising juvenile delinquency and crime, environmental pollution, inner city poverty, protraction of the period of adolescence and old age, and racial tension. The family has declined as an agency for the socialization of the young, the support of the aged, and creative recreational activity of its members, and enlightened consumerism. The fact that much ill health, physical and mental, stems from social environment while increasingly recognized in theory, remains inadequately acted upon in the profession of social and health service.

It is recommended that the new mission of Home Economics relate to the kinds of social problems affecting the individual family and wider community. In pursuing this mission, the School should become a part of a larger and more broadly oriented professional school, bringing together other units existing, or to be established, which offer pertinent competencies. To this end the Committee proposed that a new College of Human Resources be established at the University of Massachusetts/Amherst and that at least initially it include the present School of Home Economics, a School of Human Development (at present a department in the School of Home Economics), the School of Nursing, and the Department of Public Health (and at such time a school or department or a major be established in social work, we suggest that it be in this college).

In the School of what is currently called Home Economics, there will be three departments, namely: Human Nutrition, Environmental Art and Design, and Community Service. The Committee recognized that it would be useful and probably important to change the name of the School of Home Economics and they submitted four possible names. There was no strong agreement on any one name although the one which was favored by the largest number of the Committee was Consumer Arts and Sciences .

The purposes of the School of Home Economics and the School of Human Development were recommended to be

School of Home Economics (School of Consumer Arts and Sciences

a. To provide opportunities for professional and pre-professional education and training in "family serving occupations. Family is meant to include all consumer spending units, whether the nuclear family, the one-person family, or modern variance such as the commune. Many of these occupations are in community service organizations such as VISTA and Peace Corps, and others in private employment. All involve occupations related to living needs, such as nutrition, shelter, clothing, consumer spending, and family management.

b. To emphasize responsibility to society.

c. To instill in a student an awareness of the desirability of developing competence in a cohesive unit in the humanities.

School of Human Development

a. To provide opportunities for professional education and training in child development and child serving occupations, family counseling and relationships, and aging and counseling of aging.

b. To provide students with the basic understanding of the processes of human development throughout the life cycle, the psycho-histori-

cal development of man, the variety of ways in which man has developed in different cultures, and the potential of man for creating more human and humane life styles and social structures.

c. To provide opportunities for interdisciplinary cooperation by students and faculty with other units in the College of Human Resources and in the university as a whole on problems that require inter- and multidisciplinary approaches.

Various committees are at work on such matters as the new Core Course which will be an interdisciplinary course, reviewing and developing all curricula, especially for the Community Service Department which, to begin with, will include Home Economics Education, Management and Consumer Economics, as well as courses to prepare students for government, social agency and extension positions.

During the coming transitional and developmental period the Committee recommended that eight steps should be taken immediately. They are.

a. The establishment of new flexible majors and of individual programs.

b. Review the Curriculum and restructure programs.

c. Study the staffing needs and pattern of the School.

d. Establish a coordinating committee to work out the details of the Core Course.

e. Establish a student-faculty counselling committee.

f. A great effort should be made to motivate the faculty and to assist them in restructuring their approach to and presentation of subject matter.

g. Define a full-time faculty load.

h. Appoint an adviser of graduate work and an Advisory Committee on graduate study and research.

2. School Governance.

The School elected during the year the following Governance Committees

a. School Grievance Committee

b. School Personnel Policy Committee

c. School Personnel Committee

The School has had a Personnel Committee but after the Personnel Policy Committee was established, new personnel policies were adopted by the Faculty which required a restructuring of the Personnel Committee. The new Committee will serve beginning September 1971

d. One Department Personnel Committee - Human Development.

3. Student-Faculty Relations

The School's Student-Faculty Committee completed its second year of life and demonstrated a mature concern for student faculty relations, for the welfare of students in the School and for the quality of the teaching and advising in the School.

There was noticeable improvement in student-faculty relations during the year 1970-71.

4. Growth of the School

Total enrollment (705), number of majors and number graduates has increased steadily, keeping pace with the national growth. During 1970-71, the School's class enrollment was the largest in its history as was the number of majors. Also, the quality of the student body improved as evidenced by the following-

Omicron Nu (Honor Society) had its largest number of initiates - 13.

Also, more students excelled in the following ways

Six Magna Cum Laude

Fifteen Cum Laude

Thirteen Commonwealth Scholars (majors in Department of Human Development)

5. Exchange and Interdisciplinary Programs

Six Exchange Students

Starting next fall, the Textiles, Clothing and Environmental Arts Department will have one student in the Interdisciplinary Degree program.

VIII. FUTURE PLANS AND NEEDS

Assuming that the recommendations of the Chancellor's Study Committee will be implemented, considerable more space is needed for laboratory research, teaching laboratories, especially for the new Department of Environmental Art and Design, the Laboratory School, the new Community Service Department, the new courses in Housing, and offices for Faculty, clerical and technical personnel.

Skinner Hall has needed rewiring for at least eight years. This has been requested each year but no rewiring has been approved. Day to day operation is inefficient because typewriters, desk lamps, etc., cannot be used at the same time, and research has been drastically hampered. The effect on faculty morale has been tragic. Not only does current research proceed too slowly because few pieces of equipment can be used at one time, but new and sophisticated equipment needed for challenging research cannot be installed. To a lesser extent this has also deterred the teaching faculty from the innovative use of equipment.

The needs for personnel and equipment are described in our budget requests for Fiscal '72 and '73. It is not possible to specify space needs at this time except to say that the School outgrew its present facilities at least five years ago.

THE RECRUITMENT OFFICE

Annual Report: July 1, 1970 - June 30, 1971

Submitted by: Ruth C. Boicourt, Liaison Recruitment Officer.

COMMUNITY COLLEGE PROGRAM

Because of the increasing number of students eligible for transfer from the state community colleges, contact was made in the fall of 1970 with every community college in the state. Also visited were several colleges from which some Home Economics students have transferred in the past. These included Lasell Junior College, Worcester Junior College and Dean Junior College.

Parenthetically, for budget planning, this program cost the School of Home Economics very little since these were team visitations with the School of Business Administration and the College of Agriculture. A state car was used. This type of team visitation may not always be feasible, so the item for recruiting travel should be increased.

Greenfield Community College also invited me to participate in its career week program. This meant a presentation at the Store Front College in Greenfield delineating career opportunities available to Home Economists.

HIGH SCHOOL PROGRAM

The Massachusetts School Counselor's Association publishes a list of personnel in every high school guidance office in the state. For this list, and a publication called "Counselor's Notebook", it is well worth ten dollars to the School of Home Economics to be a member.

From the Guidance List, the names of 299 counselors in high schools offering college preparatory programs were selected; each received a letter outlining changes in the curriculum of the School of Home Economics.

Meetings with Guidance Counselors in several high schools indicated this kind of information was very helpful. Many wrote for additional copies of "The Guide for Majors".

The Recruitment Officer is also

1. Secretary to the School Publicity Committee.

2. A member of the University Board of Admissions and Records which meets often to establish policy as well as hear and judge student petitions.

3. An active member of Omicron Nu.

4. An advisor to nine students.

5. A member of the committee planning the University Day on Environment.

6. School Liaison with the Placement Office, posting notices as received, or notifying the appropriate faculty member.

7. A member of the Summer Counseling staff. Summer counseling should be considered a golden opportunity to welcome a student into the School of Home Economics, to explain very carefully the many opportunities available during program planning and, in general, to demonstrate a personal interest in the welfare of each student.

* * * *

Extension Division of Home Economics
July 1, 1970 - June 30, 1971
Submitted by Winifred Eastwood
Assistant Director of Extension for Home Economics

Publications, growth and professional activities of faculty doing Extension teaching are reported by the department heads of the School of Home Economics. This report includes the Extension teaching and program for the eight faculty who have Extension responsibilities. One is responsible for administration and supervision, two have been 100% Extension teaching during the year, four have taught one undergraduate resident course during the academic year thus were 80% Extension, one has been 50% resident, 50% Extension. All carried committee responsibilities in the School and the University. The impact of the program in the state is accomplished in cooperation with fifty county Home Economics Extension staff.

Food and Nutrition Program for the Disadvantaged

This program was initiated in 1969, with federal money and has been continued with some expansion in 1970 with increased monies. Program Assistants (low-income women) have been hired and trained to teach in their own communities. One approach has been through the teaching of low-income homemakers by the Program Assistant on a one to one basis or in small groups. A second approach is through groups of youth assembled for instruction. At the present time, approximately 275 assistants are working in 24 locations in the state, mostly in inner cities. Each assistant has 120 hours of training before she begins teaching. Thirteen Home Economists have been hired to supervise the larger program units, fourteen regular county staff are giving 1/4 to 1/2 time to the program. All School faculty with an Extension assignment have had some responsibilities for the program, three have carried it as a major assignment. A study done in 1970 of the impact of the program with homemakers showed a measured upgrading with some 60% of the clientele.

Change of Program Focus

Extension had attempted each year, beginning in the early 1960's to offer a program for public welfare recipients and families living in low income housing projects, but with only modest success. Several reasons for the lack of success can be cited, heavy commitment to the on-going program with middle class families from whom there was a response. The same methods used with middle income did not work in the low income communities so there was discouragement. Also, the professional staff lacked experience and training to analyze the needs and to develop methods to reach the low income family.

The new money, earmarked for the less advantaged but not sufficient to hire all new staff, required a severe evaluation of the traditional programs with some deletion and immediate

retraining of staff. The stipulation to train and pay the "poor to work with the poor," brought more success with families than had been possible earlier. Thus, staff were encouraged, plus more experience with the inner city family began to bring greater satisfaction to a percent of both the state and county staff, particularly the younger members. Some new staff were hired as stated above with only the new program as their responsibility.

In the 2 1/2 years the food and nutrition program has become somewhat the "in-thing," of Extension's program. Professionals trained in other areas of subject matter are also meeting the new audience and planning successful programs which meet the needs of the less advantaged. A study done of audience types for six months, July 1 to December 31, 1970, showed 59.2% were low-income, this included participants under both county staff and University Extension faculty and in all areas of teaching--48.2% were with audiences participating in the food and nutrition program.

Grant From Celanese Fiber Marketing Company

Professor Virginia Davis cooperated with Hampden County Extension in the development of a proposal to Celanese for resources to train homemakers to teach clothing construction in low income neighborhoods. The company granted $3,500 to be used over a two year period, also furnished hundreds of yards of material. The program is yet to be evaluated by the company and the Extension Service.

Special Programs of the Division

Programs in the following fields have been conducted as workshops or single meetings for both lay and professionals, women and men, middle and low income.

Consumer Education - The Food Market; The American Consumer in the Seventies; Legal Rights of the Consumer; "Caveat Emptor"...Let the Buyer Beware; The Spending Generation; Your Clothing $-Bonded Fabrics, Pros and Cons; Fabrics for Clothing: How They're Made.

Human Development - Family Integrity; The Change of Life; Symposium on Youth and Drugs; The Significance of Clothing.

Personal and Family Management - Developing Management Skill; Family Participation in Household Activities; Organizing for Better Management; Managing for Family Satisfaction.

Nutrition, Food and Health - Food and People; Nutrition During Growth and Development; Nutrition and Disease; The Vegetable Roundup - From Buying to Cooking; Using the Daily Food Guide Creatively.

Art and Design - Interior Design; Rich Heritage (topics related to local history and tradition); Clothing and Culture.

Leadership Development - History of the Negro in America; Time, Work, and Leisure; Effective Committees.

History of the Negro in America has been a three year program co-sponsored by the Massachusetts Extension Service and the Massachusetts Extension Homemakers' Council. The program was given in the fall of 1970, a certificate of merit by the National Extension Homemakers' Council.

Future Plans and Needs

The following recommendations made for the Extension Program by the School's study committee should be given attention and put into effect as soon as possible:

1. Increased faculty, one trained in Human Development, a second in Nutrition and Foods. New faculty should have interest and training in community problems with an understanding of the disadvantaged family. Also an ability to relate to the Program Assistants working with the families is important.

2. Extension faculty with interest and ability should have the opportunity to develop applied research related to family and community problems. This would be in place of a percent of time spent in undergraduate teaching.

3. Develop an urban center (called field station in the report) where School faculty, both extension and resident, plus students may gain first hand experience with community. Consideration should be given to having one or more faculty located at the center. An established county Extension office might be the location, with the expected cooperation of the local staff. The Program Assistants and the families they are serving are a likely audience for the study and/or observation of problems of the disadvantaged family.

DEPARTMENT OF HOME ECONOMICS EDUCATION
Annual Report, July 1, 1970 -- June 30, 1971

Submitted by: Helen R. Vaznaian, Head

PROFESSIONAL ACTIVITIES:

I. Memberships and Participation in Professional Associations and Meetings

A. Assistant Professor Marjorie F. Sullivan engaged in the following:

1. Department of Home Economics, National Education Association
2. Association for Supervision and Curriculum Development
3. New England Association for Supervision and Curriculum Development
4. Massachusetts Association for Supervision and Curriculum Development
5. American Home Economics Association
6. Massachusetts Home Economics Association Annual Meeting, May 15, 1971, Colonial Hilton, Dr. Marjorie East, The Family in the Year 2,000
7. Easter and Western Massachusetts Home Economics Association
   a. Planning Committee, August 1970, for first Professional Day for Home Economists (Issues of the 70's), co-sponsored with College Chapter, A.H.E.A.
   b. Planning Committee, May 1971, second Professional Day for Home Economists, November 1971
8. National Council of Family Relations; Attendance at National Conference, Estes Park, Colorado, August 1971
9. Massachusetts Council of Family Relations
10. State College, Framingham and Division of Career Development, State Department of Education Meeting, April 30, 1971, on Curriculum for Occupational Education

B. Associate Professor Helen R. Vaznaian is a member and participant in the following:

1. National Education Association
2. Department of Home Economics, National Education Association
3. Association for Supervision and Curriculum Development
4. New England Association for Supervision and Curriculum Development; Planning Committee, N.E.A.S.C.D. Summer Conference, Westfield State College, Westfield, Mass., July 22-24, 1971
5. Massachusetts Association for Supervision and Curriculum Development
6. American Home Economics Association
   a. Agency Member Unit Representative (Accreditation Committee, A.H.E.A.)
   b. Task Force of Home Economics Teacher Education Section: Preparation of Personnel for the Inner City, Elizabeth Ray, Chairman
7. Massachusetts Home Economics Association
   a. Annual Meeting, May 15, 1971, Colonial Hilton, Dr. Marjorie East, The Family in the Year 2,000
   b. Chairman, Home Economics Teacher Education, M.H.E.A.
   c. Executive Board, M.H.E.A.

8. Eastern and Western Massachusetts Home Economics Association
   a. Planning Committee, August 1970, for first Professional Day for Home Economists (Issues of the 70's), co-sponsored with College Chapter, A.H.E.A.
   b. Planning Committee, May 1971, second Professional Day for Home Economists, November 1971
9. Co-advisor, College Chapter, American Home Economics Association
   a. Fall Professional Day as described in 8 a.
   b. Spring: Tour of Campus, Dinner, Ice Cream Smorgasbord and Presentations: Home Economics at U. Mass. (Study proposal) State College Framingham and Simmons. Dialogue followed: (Friday Evening). Saturday: Mass. State Association Meeting: Students participated in Rap, Reason and Resolve Sessions: a reaction to the major presentation, The Family in the Year 2,000
10. Board of Directors, National Association for Armenian Studies and Research (affiliated with Harvard University, UCLA and Columbia)
    a. Member of the Executive Board
    b. Annual Assembly, Chairman, Nominating Committee
    c. Chairman, Academic Affairs

11. Member, Personnel and Counseling Association, Boston University
12. Pi Lambda Theta, National Honor Society for Women in Education
13. State College, Framingham and Division of Career Development, State Department of Education Meeting, April 30, 1971, on Curriculum for Occupational Education

II. University and School of Home Economics Committees

A. Assistant Professor Marjorie F. Sullivan:

1. A.A.U.P., Faculty Welfare Committee
2. Faculty Senate Foreign Student Affairs Committee
3. School of Home Economics Scholarship and Financial Aid Committee
4. School of Home Economics Personnel Policies and Procedures Committee

B. Associate Professor Helen R. Vaznaian:

1. Graduate Committee
2. Summer School Committee
3. Publicity Committee
4. The School of Home Economics Study Committee; Research and author: The Present Status of the Home Economics Profession
5. Ad Hoc Committee for Jane McCullough (rank promotion)
6. Ad Hoc Committee for Herbert Paston (tenure decision)
7. Search Committee for a New Dean, Fall 1971 (Chairman)

III. Professional Development

A. Assistant Professor Marjorie F. Sullivan participated in an unstructured, five-week experience in Austria, Italy, Greece and France, involving an attempt to study on an informal, first-hand basis, patterns of family interaction, child rearing practices, including direct and indirect references to sexual socialization of children. Effective means of obtaining

this experience involved the simple expedient of shunning commercial food and lodging establishments in so far as possible and instead sharing the meals and staying in the homes of willing familes, especially those involving children.

B. Associate Professor Helen R. Vaznaian continued research into the Historical Development of the Newton Public Schools, Newton, Massachusetts, 1965-1970.

MAJOR ACCOMPLISHMENTS:

I. Research on Teacher Evaluation

A. Orientation Handbook for Students and Cooperating Teachers

B. Revised evaluation measures for assessing teacher competency. (Project under the direction of Helen R. Vaznaian carried out by Graduate Teaching Assistants, Mrs. Ruth Lauroesch and Mrs. Gail Bjorklund with the cooperation of Mrs. Marjorie F. Sullivan, the Cooperating Educational Institutions, the Cooperating Teachers and the Home Economics Education Student Teachers.)

II. Initiation of Lecture Series on Human Sexuality under the Direction of Mrs. Marjorie F. Sullivan

As a result of student request, and planned in cooperation with members of the Home Economics Education Department Student-Faculty Committee, the Lecture-Discussion series on Human Sexuality evolved. The following disciplinary team, coordinated by Mrs. Marjorie F. Sullivan, participated in the series:

Michael A. Cann, Ph.D., Clinical Psychologist

William A. Darity, Ph.D., Head of Department and Professor of Public Health

Dr. Robert W. Gage, Director, University Health Services

Dr. LeRoy J. Kendrew, University Staff Physician

Eleanor B. Luckey, Ph.D., Head of Department and Professor of Child Development and Family Relations, School of Home Economics, University of Connecticut and President of the National Council of Family Relations

Donald Read, Ed.D., Assistant Professor of Public Health

George H. Reed, M.P.H., Staff Assistant, Environmental Health and Safety

Mrs. Jane Zapka, M.S., Health Educator

A total of 290 undergraduate students were serviced by this series this year.

The success of this series led to a request by the Head of Residence of Gorman House, a co-educational dormitory, for a similar series to be taught there. This was coordinated and taught by Mrs. Sullivan to 50 undergraduate students, one half of whom were males.

Student evaluation of the course in terms of contribution to personal development were many and mostly favorable. One male wrote:

> "and I now see sexual expression as a wonderfully shared experience with a person I love deeply. I can no longer think of it as something I 'get out of' a woman."

III. Pilot Student Internship Program Formulated

Beginning with the Fall Semester, 1971, a full semester Student Internship Program will be offered as an alternative to the present arrangements. The Pilot Study will be carried on in the Newton Public Schools, Newton, Massachusetts and will consist of:

A. Seminar Sessions once a week with all interns in the School, i.e., combined with those from Harvard, Boston University, Boston College and Brandeis. Students will be concerned not only with their specific teaching assignment, but with gaining knowledge and understanding of the new institutional arrangements for Humanistic Education. This will include an examination of administrative, curriculum, guidance and pupil personnel practices at the secondary school level.

B. Curriculum and methods will be taught in a four-hour module directly relevant to the on-going teaching in the classroom in Newton.

C. A casette of feelings on the part of student teachers will be maintained as one aspect of the evaluative feedback of the program. Other aspects will be developed as the program evolves.

IV. Follow-up Study of Graduate Students

Inspired by a recent request from Dean Appley to examine occupational placement for recent (within three years) graduate students, a random follow-up study revealed a diversity of professional roles fulfilled by majors in Home Economics Education. Some examples are:

Gail Bjorklund, Director of Child Development Laboratory Program in the Department of Home Economics, Montgomery County Public Schools, Maryland.

Marion Feeney, upon completion of M.S., became Instructor, School of Home Economics, University of Connecticut.

May Huang, upon completion of M.S. degree, continued to Ph.D. program at the University of Illinois. She is presently teaching at Keene State College.

Helen McGinley, upon completion of M.S., became Assistant Editor, Division of Home Economics, Ginn & Company, Boston.

Charlotte Murphy, upon completion of M.S., became Director of Teaching Resource Materials and Aids in Consumer Education for Secondary School Teachers, Forecast Magazine, New York.

Norma Rivera, Head of Department of Home Economics at a private college, Thailand.

Elizabeth Sweet, upon completion of M.S., became Home Service Representative, Springfield Gas-Light Company.

V. Expanded Student Exchange Program

Increasing numbers of our majors are participating in the University exchange programs. We were fortunate to have Marilyn Gaskin from the University of New Mexico (our second from U.N.M.) and two, Judy Collins and Suzy Garfinkel, who will be saying Aloha to Verda Dale at the University of Hawaii next year.

PUBLIC SERVICE

I. Associate Professor Helen R. Vaznaian carried out the following:

A. Director: Institute for Inner Core Teachers. Boston Public Schools, Dorchester, Mass., April 7, 1971. Presentation: Humanistic Education: Focus on Individualization in Home Economics Education.

> ".... You have the qualities which provoke interesting and imaginative ideas.
> We are very grateful for your service and hope that it is only the beginning of a long and fruitful contact with you and the University of Massachusetts."
>
> Aurelia Kelly, Director
> Home Economics
> Boston Public Schools

Note: 157 teachers of home economics in Boston Public Schools.

B. Director: Institute for Home Economics Teachers in the Brookline Public Schools, Brookline, Mass. Presentation: The Development of Individual Potential: Implications for Home Economics Education.

C. Director: Institute for Cooperating Teachers, (Student Internship Program), Campus Center, April 1971. Focus: Teacher Evaluation. The Graduate Teaching Assistants organized and conducted this Institute. The full staff participated.

FUTURE PLANS

I. We will implement many aspects of the Community Service Major next year. New courses and selected alternative experiences will be planned in keeping with our commitment to Humanistic Education. We would hope to have a liaison member from each department share in the planning and implementation.

II. Alternative arrangements to the present eight week student teaching experience will be implemented and expanded. This expansion will serve both the needs of those oriented to the field of Home Economics Education as well as those in the general Community Service Major.

III. We welcome and anticipate a series of meaningful dialogues with all who are currently housed under the umbrella of the School of Home Economics. These will play a significant role in the implementation of new programs and majors.

FUTURE NEEDS

I. Professional Staff

The following is the Spring Semester Course Load for a department currently staffed with two full time members, one of whom serves as administrative head. The Undergraduate program has 125 students; the graduate program has 40 part-time and full-time students.

HOME ECONOMICS EDUCATION
Spring Semester Course Load

Course	Name	Professor
Education 285	Observation & Student Teaching (9 credits)	M. Sullivan
HEEd. 382	Curric. & Methods (4 credits)	M. Sullivan
HEEd. 386	Teaching Human Sexuality (M. 4-6:00)	M. Sullivan
HEEd. 387	Problems in Home Economics Education (Th. 11:15-1:10) (2 credits)	H. Vaznaian
HEEd. 388	Problems in Home Economics Education (Sec. 1, Tu.-Th. 2:30-3:45) (3 credits)	H. Vaznaian
HEEd. 388	Problems in Home Economics Education (Sec. 2, Tu.-Th. 4:00-5:15) (3 credits)	H. Vaznaian
HEEd. 390	Seminar in Home Economics Education (Tu.-Th. 2:30-3:45) (2 credits)	Grad. Teaching Assistants
HEEd. 391	Seminar in Human Sexuality, (Sec. 1) (M. 7:30-10:00 p.m.)	M. Sullivan
HEEd. 391	Seminar in Human Sexuality, (Sec. 2) (W. 7:30-10:00 p.m.)	M. Sullivan
Education 585	(9 credits)	H. Vaznaian
HEEd. 682	Curric. & Methods (3 credits)	H. Vaznaian
HEEd. 700	Special Problems in HEEd. (6 credits) (five completed)	H. Vaznaian
HEEd. 800	Thesis in Process (10 credits)	H. Vaznaian

In addition to teaching the above courses, Miss Vaznaian administrates the department and guides graduate student programs of study, Special Problems and theses, and carries on an active in-service education and/or consultant program within the state. She is equally active in Connecticut.

The Home Economics Education Department needs addition of staff as follows:

1. At least one for the expanding Undergraduate program, i.e., to teach some undergraduate courses and to assist in the supervision of student teachers and/or alternative field experiences.

2. At least one to teach at the Graduate Level, to engage in research related to urban school needs, and/or career development programs related to home

economics for the secondary school level, as well as guide Master's and Doctoral Theses in Home Economics Education or Vocational Technical Education in the School of Education. (All appointments should be dual or cooperative appointments with the School of Education.)

3. At least one to teach undergraduate courses essential to the Community Service Major, engage in research, direct alternative field experiences.

II. Physical Facilities and Space

We are desperate! One room in Hampshire serves as the focal point for all our instructional and/or resource needs. We request that additional space be made available to us.

III. Secretarial Staff

For six consecutive years this department has consistently requested and substantiated the need for a full-time responsible secretary. The imperative need continues. The request is once again made.

IV. Need for Financial Support

This year, Mrs. Sullivan, Mrs. Bjorklund, Mrs. Lauroesch and Miss Vaznaian personally assumed the major share of travel costs necessary for the supervising of student teachers and/or the Institute Programs. Although our student teaching enrollment tripled, our travel funds decreased approximately 50%. Needless to say, no funds were made available for participation in national professional meetings.

Major space, specialized facilities and equipment needs have not been met due to lack of adequate financial support.

V. Need for Better Understanding of Home Economics as an Interdisciplinary Field of Study

"There is a common body of knowledge derived from the general studies component and from specific courses in home economics which provides for a general program in home economics and which is also relevant to each of the areas of specialization. The concepts, common to all programs, include some understanding of: 1) the family in society, 2) human growth and development in relation to nutrition, 3) human development and its relation to the family, 4) management of human and material resources, 5) aesthetic qualities in the environment, 6) the influence of science, technology, and consumer economics upon families and family members, and 7) the philosophical base of home economics and the relation of its specialties to the field as a whole".[2]

With Appreciation

We would be remiss if we did not express our deep appreciation of the cooperation we received from the Department of Human Development in making the student teaching experience in the Laboratory Nursery School available to our Home Economics Education majors this year. The dialogues with Dr. Grace Craig, Mr. Dumas and all the Head teachers were most helpful. We look forward to continued cooperation in areas of mutual concern.

While we have strongly stated our dire needs, we nevertheless appreciate the general administrative support given this department. We welcome its continuation.

HRV:kmc:6/3/71

DEPARTMENT OF HUMAN DEVELOPMENT

ANNUAL REPORT: JULY 1, 1970 - JUNE 30, 1971

FACULTY PUBLICATIONS, RESEARCH GRANTS, RESEARCH PROJECTS, AND OTHER PROFESSIONAL ACTIVITIES

Submitted by:
Ellis G. Olim, Ph.D.

Publications

The following articles have been published (or are in press) since the last report:

Collard, R. R. Exploratory and play behaviors of infants reared in an institution and in lower-class and middle-class homes. Child Development, December, 1971, in press.

Collard, R. R. The preschool attainment record. In O. Burros (Ed.), Seventh mental measurements yearbook, 1971, in press.

Collard, R. R. The Bayley Scales of Infant Development. In O. Burros (Ed.), Seventh mental measurements yearbook, 1971, in press.

Collard, R. R. Reprint of Social and play responses of first-born and later-born infants in an unfamiliar situation (Child Development, 1968) in J. F. Rosenblith, W. Allinsmith and J. P. Williams (Eds.), Readings in child development and educational psychology, Allyn and Bacon, in press.

Turner, B. F., Tobin, S. S. and Lieberman, M. A. Personality traits as predictors of institutional adaptation among the aged. Journal of Gerontology, in press.

Turner, B. F. and Turner, C. B. Perception of the occupational opportunity structure, socialization to achievement, and career orientation as related to sex and race. Proceedings, 79th Annual Convention, American Psychological Association, 1971.

Olim, E. G. Maternal language styles and cognitive development of children. In F. Williams (Ed.), Language and Poverty: perspectives on a theme, Chicago: Markham Publishing Co., 1970.

Olim, E. G. Reprint of The self-actualizing person in the fully functioning family (The Family Coordinator) in F. Cox (Ed.), A Commentary on Marriage, Morals, and Youth, Wm. C. Brown Co., in press.

Papers

Turner, B. F. Perception of the occupational opportunity structure and socialization to achievement as related to sex and race, delivered at the Forty-second Annual Meeting of the Eastern Psychological Association , New York City, April 17, 1971.

Turner, B. F. and Turner, C. B. Perception of the occupational opportunity structure and socialization to achievement, and career orientation as related to sex and race, to be presented at the 79th Annual Convention of the APA, September 3, 1971.

Invited Talks and Guest Lectures

Turner, B. F. Social-psychological impact upon the aged of entrance to nursing homes. Invited talk to groups of nursing home administrators in a conference called by U. Mass.School of Public Health, January 29, 1971.

Olim, E. G. Family planning. University Day on Environment, June 2, 1971.

Housing design and behavior. Guest lecture, Housing Design Course, April 6, 1971.

Social constraints and the physical environment. Guest lecture, Visual Awareness Course, April 7, 1971.

Psychology of Public Health implementation. Guest lecture, Public Health Seminar, March 15, 1971.

Dumas, T. Leadership through understanding. Invited address to the Massachusetts Youth Leaders Institute, Ashfield, April, 1971.

Articles and Books in Preparation

Olim, E. G. Language and cognitive development. Book in progress to be published by Scott-Foresman.

Collard, R. R. Parental discipline of aggressive behaviors in four-year-old Chinese and American children. With Tien-Ing Niem. To be submitted to the Journal of Social Psychology, Summer, 1971.

Play and exploration in infants. To be submitted to The Merrill-Palmer Quarterly, Summer, 1971.

Turner, B. F. and Kahn, R. L. Age as a political issue. To be submitted to the Journal of Gerontology.

Research in Progress and Research Grants

Dr. Collard	Research grant received, titled, "Generalization of habituation in infants." Group formation in young preschool children.
Dr. Olim	Deep structure analysis of children's linguistic ability.
Dr. Turner	Large-scale survey of housing needs of elderly residents in the Amherst area.
Dr. Turner	and Dr. Olim. Grant application to NIMH in preparation titled, "Family stress and dislocation as a function of upward social mobility of college-attending children from blue-collar families."
Dr. Olim	Grant application pending with Carnegie Corporation, titled, "Deep structure analysis of children's linguistic ability."
	Grant application in preparation for funding of an Environmental Education Program for young children.
Dr. Craig	Validity data being collected on the Boehm Test of Basic Concepts.

The following research project of a graduate student, under faculty direction, was completed:

A study of the child's conception of continuous quantity. (Dr. Olim, Director.) The study is in part a replication and in part a modification of Jean Piaget's classic conservation of continuous quantity experiments, using a sample of 20 four-year-olds, 20 five-year-olds, and 20 six-year-olds. The study is an attempt to clarify some of the concepts children have of a liquid quantity and the reasons they give for having these concepts, leading to a greater understanding of how the concept of conservation develops within the child.

Consultantships

Mr. Dumas has been consultant to Rubin, Maloney and Associates (school psychologists) to advise them on the setting up of a preschool.

Dr. Turner and Dr. Olim have been consultants to the Amherst Housing Authority on housing for the elderly.

Dr. Olim has been a consultant to the Expanded Nutrition Program of the Cooperative Extension Service. He visited all the counties, several more than once, to conduct workshops and seminars for the nutrition aids on the

paychological aspects of relating to home-makers in the nutrition program.

Dr. Craig has been a consultant on statistics and computer programming.

Other Professional Activities

a. Cooperative Extension

Professor Burroughs conducted a series of presentations in most of the counties on Youth and Drugs: the role of educational agencies, and the family and parental role and responsibilities. The program, set up by Professor Burroughs, involved the use of various community agencies and professionals in attacking the drug abuse problem. Sex Education and Family Integrity programs were also conducted.

b. Other

Mr. Dumas was chairman of the National Association for the Education of Young Children Task Force for the Education of Young Children; is president, Western Massachusetts Association for the Education of Young Children; is secretary-treasurer, New England A.E.Y.C.; and is vice president, Massachusetts Association for Childhood Education.

Dr. Collard is advisor to the South City Tutorial Center in Holyoke, Massachusetts, and is a member of the board. Dr. Collard attended the following professional meetings: New England Psychological Association, Boston; and the Conference of the National Association for the Education of Young Children, Boston. The latter was also attended by the Laboratory School lecturers.

Dr. Turner attended the annual meeting of the American Psychological Association and the Eastern Psychological Association.

Dr. Olim attended the annual meeting of the New England Psychological Association. He also attended the Western Massachusetts Mental Health Conference conducted jointly by the Mental Health Department and the Department of Psychology. Finally, Dr. Olim conducted a workshop on Family Planning for the University Day on Environment, June 2, 1971. He represented the University at the Institute on Man and Science, N.Y., July, 1970. Dr. Craig attended the annual meeting of the New England Psychological Association, the annual meeting of the National Association for the Education of Young Children, and an International Symposium on the Ecology of Child and Human Development, Miami, Florida.

Major Accomplishments of the Department

Some of the following could have been presented in the preceding section; but because they represent major accomplishments, they are being reported here. Professor Burroughs, as chairman of the University Tenure and

Grievance Committee, has continued to perform outstanding and yeoman service. He, together with Dr. Olim, has also served on and helped implement the new personnel policies adopted by the Board of Trustees. Both served on the School of Home Economics Ad Hoc Committee to set up a Personnel Policy Committee; they served on the election committee; they served on the election committee to establish the Personnel Committee; and on the Ad Hoc Committee to set up a Grievance Committee and to conduct the elections. Dr. Olim was chairman of the Personnel Policy Committee; Professor Burroughs, chairman of the Committee to set up a Grievance Committee.

Professor Burroughs was chosen to be the faculty representative to the Board of Trustees next year, a signal honor.

Dr. Olim served as a Senator for the past year. He also served on the Steering Committee to set up an Institute for Man and His Environment, which has now been established. He also served on the Education and Research Sub-committees of the Institute and participated in teaching the first University-wide course on ecology.

Dr. Olim served on the Home Economics Study Committee, which has made its recommendations to the Administration. He has also served on the Search Committee for a Dean of the School of Home Economics with the retirement of Dean Canoyer. Finally, he has been serving on the School of Nursing Study Committee.

Faculty-Student Relations and Educational Innovations

A number of recommendations of the Home Economics Study Committee with respect to the Department of Human Development have already been adopted by the Faculty for next Fall. These include a lowering of the number of required courses to 24 semester hours (with an attendant increase in the number of liberal education electives) and the opening up of many new career options to students majoring in Human Development: Special Education, Youth Development, Community Action, Family Counseling and Relations, work with the Aged, and special independent study majors. These, of course, are in addition to previous options (Early Childhood Education, Child Development, and Human Development).

A strong effort was made during the past year to improve the number of contacts with students, particularly informal or extracurricular contacts. Professor Burroughs worked with 13 students interested in independent study. Dr. Olim met several times with his perceptees (Commonwealth Scholars, the number of whom grew from 6 to 13 during the year). Under the new advising system (whereby students are grouped by residence), the faculty advisors visited the students in their dormitories, which created good relations and good will.

Dr. Olim was invited to present a seminar for Commonwealth Scholars next Fall on Human Development and has accepted. The reception of the introduction of this course by the students was enthusiastic. Dr. Olim also participated in the interviewing of prospective Commonwealth Scholars from among students to enter as Freshmen next Fall.

Dr. Collard, Dr. Craig, and Mr. Dumas have continued to work with students interested in special problems courses and independent study. Dr. Craig is sponsor of a student who is seeking a bachelor's degree with individual concentration -- a new program of the University.

A number of students went to Merrill-Palmer Institute of Human Development and there was an upswing in the number of exchange students, notably to the University of New Mexico and the University of Hawaii.

Citations

The work of Dr. Collard and of Dr. Olim was cited in Carmichael's manual of child psychology, which is a comprehensive review of the state of knowledge in the fields of child psychology and child development.

Growth of Major and Class Enrollment

The major and class enrollments continued to grow rapidly. From 214 majors a year ago the major has grown to 403, at which number the major was closed for lack of staff and teacher-training facilities to handle more than that number. There is a waiting list of 30 students as at the date of preparation of this report. Class enrollments increased from 468 a year ago to 1,004 this Spring. (See Tables 1 and 2.)

Table 1. Undergraduate Class Enrollment

Course	Spring 1970	Spring 1971
HD 270	175	252
HD 310	33	66
HD 350	21	6
HD 360	--	67
HD 380	58	133
HD 381	49	72
HD 382	34	81
HD 383	49	67
HD 384	14	29
HD 385-8, Spcial Problems	5	203
HD 389, Special Problems	7	7
HD 391. Senior Seminar	23	21
	468	1,004

Table 2. Undergraduate Majors in Human Development

	May 1969	May 1970	May 1971
All classes	155	214	403*
Freshmen	37	59	96
Sophomores	37	71	168
Juniors	34	47	92
Seniors	47	37	47

*There are 30 students on a waiting list to transfer in to Human Development.

Graduate Program

Although our graduate program is disappointingly small (attributable primarily to the very small faculty we have and the insistent demands made upon us by the rapid growth of the undergraduate body), nevertheless there are signs of encouraging progress. Until two years ago, we have had few applications for graduate study and customarily have had only three full-time graduate students. During this past year we have had 14 graduate students and we have accepted 19 students for next Fall. Since some of the 14 of last year will carry over into next year, we should have the largest number of graduate students in our history.

Child Study Center

During the year we opened the Human Development Child Study Center and we are building our research training program.

Student Advising

This year we redistributed our advisees so that students living in the same general vicinity report to the same advisor, who is assisted by several seniors acting as "senior advisors". Under this plan, we believe we have created a sense of "community" among the students and have given under-class students the benefit of the experiences of the senior advisors. It is too early to assess the value of this method of advising students; however, early indications are that it has had a great deal to do with giving the Human Development major greater visibility among the students, and has made the advising problem easier for the students.

Future Plans and Needs

As stated in last year's report, the development of a Ph.D. program is, in our opinion, an urgent need despite the surplus of Ph.D.s in many fields. Our solution to the problem, as stated in the Home Economics Study Report, is to seek to form innovative Ph.D.s, rather than to add still another Ph.D. (in Human Development) to the large number in the University. Our proposal is to work out joint Ph.D.s with relevant departments and schools that already have doctoral programs, notably, Psychology, Sociology, and the School of Education. We believe that this move toward interdisciplinary cooperation is not only in the spirit of the times but also what society is demanding of higher education as higher education moves away from narrow specialization to more problem-oriented emphases.

Staffing

With the completion of the Home Economics Study, it is ferverently hoped that the Administration will give us more support, particularly in the way of increased staff and the opportunity to appoint persons at senior levels. The faculty staffing pattern is presently overly weighted on the side of junior faculty. We believe that the addition of senior faculty will not only provide a better balance but also accelerate the implementation of new programs, including greater attention to the graduate program.

9/1/71

Department of Management and Family Economics
July 1, 1970-June 30, 1971
Submitted by
Dr. Verda M. Dale

I. Faculty Publications, Research grants, research projects, and other professional activities:

Faculty Publications:

Dale, Verda M. and Susan J. Uhlinger. "Resources in Home Economics for the Blind Homemaker," Massachusetts Home Economics Association. 1969, 23 pp.

Research Grants: None

Research Projects: None

Professional Activities:

Verda M. Dale:

Chairman, Resolutions Committee of American Home Economics Association

Attended American Home Economics Association annual meeting, Denver, Colo., June 1971.

Attended American Home Economics Association workshop, Washington, D.C., August 1970.

University:

Chairman, Senate Faculty Affairs Committee
Member, Senate Academic Matters Committee
Member, College of Agriculture Advisory Council for International Agriculture
Member, Advisory Committee for International Programs

School:

Member, School of Home Economics Study Committee
Member, Undergraduate Curriculum Committee
Member, Graduate Committee
Member, Ad Hoc Committee for Personnel Action

Marjorie M. Merchant

Paper (by invitation from U.S. Department of Commerce) presented to National Metric Study Consumer Affairs Conference at the National Bureau of Standards, Washington, D.C., October 12, 1970.

Dept. of Management and Family Economics, July 1, 1970-June 30, 1971

I. Professional Activities:

Director of American Council on Consumer Interests
Discussion leader for conference on Family Income Maintenance Plans, FEHM section, American Home Economics Association, Denver, Colo., June 1970.

University:

Member, Advisory Board, Massachusetts Consumers Association, Inc.
Member, Senate Continuing Education Committee
Member, Joint Council on Economic Education

School:

Chairman, Personnel Committee
Member, Search Committee for New Staff Member
Advisor, Omicron Nu

II. Major accomplishments of your unit during the fiscal year 1970-71.

The Department of Management and Family Economics is a small unit with a current staff of three persons, all of whom have a joint Cooperative Extension-resident teaching appointment. There are no provisions for research. The assignment to resident teaching totals .7 of one position. Even with this small resource, the department had a total of 882 contact teaching hours this year, including several graduate problems. One graduate student completed her requirements for an M.S. degree with a concentration in consumer problems. The demand for this subject matter continues to grow, although no undergraduate major is offered.

The Cooperative Extension program has had a strong emphasis on problems affecting low-income segments of the population. Ninety-three program assistants were trained in organization for better management during the year, and work with family economics and consumer problems has been carried out in counties with program assistants for the expanded nutrition program.

III. Special projects or programs operated by your unit:

Miss Merchant carried on a pilot 6 weeks workshop on consumer education in cooperation with Vista, Berkshire Community College and Berkshire Cooperative Extension program. Twenty low-income homemakers were trained in consumer affairs. They in turn will serve as leaders in their community.

Four students majoring in the TCEA department received special advising and help in consumer problems from Miss Merchant, although the course numbers carried the TCEA label.

Dept. of Management and Family Economics, July 1, 1970-June 30, 1971

IV. Future Plans and Needs.

The School of Home Economics Study Committee made a number of recommendations that, if accepted, would affect the department. One recommendation was to form a department of Community Services which would combine the present departments of Management and Family Economics and Home Economics Education and redirect their efforts toward an expanded community services major which would permit greater flexibility in preparation of students. This department is enthusiastic about the potential for such an undergraduate major since it offers great opportunities for integrating teaching, research and extension into meaningful programs. Should this recommendation be implemented or not, the most urgent need is for resident teaching staff, at both the undergraduate and graduate levels. Unless some resources can be placed in this area, the subject matter represented in the department should be withdrawn from the offerings of the School.

DEPARTMENT OF NUTRITION AND FOOD

Annual Report, July 1, 1970 - June 30, 1971

Submitted by: Dr. Christine H. Hillman, Acting Head

1. Faculty publications, research grants, research projects and other professional activities.

Publications

Beal, Virginia A. Nutritional studies during pregnancy. I. Changes in intakes of calories, carbohydrates, fat, protein and calcium. Journal Amer. Diet. Assoc. 58: 312-320, 1971.

Beal, Virginia A. Nutritional studies during pregnancy. II. Dietary intake, maternal weight gain and size of infant. Journal Amer. Dietet. Assoc. 58: 321-326, 1971.

Davis, Dorothy and C. A. Boyd. Family Meal Management and Microwave Cooking. Microwave Energy Applications Newsletter, vol. III: 4, 3 (1970).

Davis, Dorothy, D.E. Pratt, E.F. Reber and R.G. Klockow. Microwave Cooking in Meal Management. Journal of Home Economics, 63: 97, (1971).

Raheja, K.L., E.F. Reber, D.L. Anderson and M.H. Bert. Effects of testosterone propionate and dicumarol on prothrombin rate and serum cholesterol level in capons and orchiectomized rats. Gen. Comp. Endoc. 16 (1971), 385.

Manuscripts for publication

Beal, V.A. The finicky eater. Family Health. Scheduled for publication, June 1971.

Raheja, K.L., E.F. Reber, M.H. Bert and J.G. Snedecor. Response of prothrombin rate to exogenous testosterone in castrated rats fed dicumarol. Submitted for publication in Ind. J. Physiol. Parmacol.

Umapathy, K.P., P.B. Mack, and E.A. Dozier. Effect of bed rest on urinary excretion of creatine and creatinine with certain possible ameliorating measures applied in man. Accepted for publication in Aerospace Medicine.

Umapathy, K.P., P.B. Mack and E.A. Dozier. Effect of immobilization and exercise on urinary excretion of creatine and creatinine in primates. Accepted for publication in Aerospace Medicine.

Umapathy, K.P. and M.H. Bert. Cholesterol and non-cholesterol lipid levels in plasma of chicks fed legume or animal proteins, and legume carbohydrates, sucrose or starch. Submitted for publication in the Journal of Arterio-Sclerosis.

Contributions to National Scientific Meeting

Beal, V.A. Seminar on Nutrition Methodology in Longitudinal Growth Studies, Department of Maternal and Child Health, Harvard School of Public Health, Boston.

Research Grants

Grant UI-00148-06, Health Significance of Radiolytic Products in Foods, from Consumer Protection and Environmental Health Service, Public Health Service, Department of Health, Education and Welfare. The research work supported by this grant is shared by the Department of Food Science and Technology and the Department of Nutrition and Food. Dr. W.W. Nawar is the principal investigator and is in charge of preparing the radiolytic products. Dr. M.H. Bert is in charge of the nutrition experiments designed to measure the effects of feeding these products to a large number of mice. The possible toxicity of substances arising from the breakdown of fat in meat subjected to sterilizing radiation. Twenty-five such substances have been fed to 3 successive generations of mice according to the most sensitive and rapid experimental design approved by the Food and Drug Administration. This large population of mice has been kept free of infectious diseases. The histological study of the mice is in progress. It is expected that this grant will be continued for 2 years more. Sixty other radiolytic products were discovered in radiation sterilized meat and should be evaluated through feeding experiments.

Other Professional Activities

Mrs. Clarinda W. Hankinson was appointed Visiting Lecturer, 1/2 time, for the second semester.

Kathie L. Framke and Carol A. Laudano were appointed Graduate Teaching Assistants. Mabel M.L. Lin and Boaz A. Mafarachisi were appointed Graduate Research Assistants.

The entire faculty of this Department participated in the revision of undergraduate curriculums, and contributed information for the Committee to Study the School of Home Economics.

The Allied Health Professions Improvement Program Project 5-E01-00589-04-Dietetics (Bert) for Basic Improvement of Teaching of Dietetics was in operation from April 15, 1970, through April 14, 1971. The application for continuing this project was approved; thus this project is being continued through March 31, 1972. Dr. Bert is Director of this project. Audio-visual aids and equipment, booklets, expendable equipment and non-expendable equipment for dietetics courses were purchased at a cost of about $10,200. The capacity and efficiency of a food storage room adjacent to a laboratory was increased at a cost of about $700. A part-time lecturer in dietetics was paid $2,500. Two part-time teaching assistants in food courses were paid $1,250 each. A part-time clerk was paid $500 for preparing classroom materials. About $1,400 was spent for travel expenses of faculty members who attended several meetings or national conventions which produced information of direct benefit to this project.

Miss Virginia A. Beal joined the faculty of the Department of Nutrition and Food last January 1971. Since then she has attended the American Association of Physical Anthropologists Meeting, Boston, and the meeting of New Knowledge of Baby Foods, New York City. She has also given talks at the Journal Club, Western Mass. Dietetic Association, Amherst; Refresher course for Home Economics Teachers, Amherst; Golden Age Club, Northampton; Seminar for Nursing Home Administrators (panel member), Amherst; Seminar on Nutrition Methodology in Longitudinal Growth Studies, Department of Maternal and Child Health, Harvard School of Public Health, Boston; and University Day on Environment (panel member), Amherst. Miss Beal has been an active participant in departmental meetings held by both faculty members and graduate students of the Department of Nutrition and Food.

Dr. Bert continued to serve as Head of the Department of Nutrition and Food through August 31, 1970. He continued to serve as Chairman of the Search Committee for the position of Head of the Department of Nutrition and Food through October 15, 1970, when the committee was discharged after Dr. Pellett accepted this position. Dr. Bert served on the following committees of the School of Home Economics: Graduate Committee, Personnel Policy Committee, Summer School Committee. He served on the following University organizations: Faculty Senate, Graduate Council, Computer Committee, Human Subject Review Committee, Advisory Committee of the Center for International Agricultural Studies. He was a guest lecturer in course PE 621, Physiological Basis of Human Performance. He attended the Faculty Conference on Undergraduate Education (theme: Creating a More Satisfying Teaching-Learning Environment) held on campus on November 11, 1970. At the request of the Department of Food and Agricultural Engineering he had a 3-hour conversation with Eugeniusz Rembowski, Ph.D., of the Institute of Fermentation Industry, Warsaw, Poland, who requested information on composition and efficiency of baby foods and on baby nutrition and dietetic foods for babies. Dr. Bert put Dr. Rembowski in touch with Professors Harriet Wright and Virginia Beal and with Professor Sanford Miller of the Oil Science Laboratory in the Department of Nutrition and Food Science of the Massachusetts Institute of Technology. Dr. Bert assisted Dr. J.L. Balintfy of the School of Business Administration in preparing a grant application which was submitted to the Public Health Service, Department of Health, Education and Welfare. The proposal is entitled Mathematical Modes for Diet Constraints in Hospitals. The aim of the research is to develop nutritionally sound and feasible computational foundations for the determination of nutrient intake allowances for individuals or groups of individuals in a hospital environment or, in other words, to apply computers to the optimization of nutrient intake of hospital patients. The budget for the 3-year project period is $222,171. Dr. Bert prepared a grant application which was submitted to the Division of Allied Health Manpower, Bureau of Health Manpower Education, National Institute of Health, Public Health Service, Department of Health, Education and Welfare. This was an application for an Allied Health Professions Traineeship Grant for Advanced Training of students in dietetics. This grant would pay stipends to candidates for the M.S. or Ph.D. programs in the Department of Nutrition and Food; Dr. Bert would administer the grant funds for both programs. The budget for the first year is $37,100. Estimates for 5 years of traineeship support were submitted. Dr. Bert served as host to the panel on Food of the Present and Future, on University Day on Environment sponsored by the Cooperative Extension Service at the University of Massachusetts, and the U.S. Department of Agriculture and the County Extension Services, on June 2, 1971.

Miss Dorothy Davis returned to her duties as Associate Professor, School of Home Economics, in September after having spent the previous semester on a sabbatical leave in the Department of Foods and Nutrition, Purdue University. While at Purdue University, she pursued research in the field of microwave cooking and worked on some new techniques in the teaching of foods. This has led to a number of new and innovative activities in Miss Davis' teaching this past year. The students have reacted favorably and have enjoyed being among the first to assist in carrying out such innovations. In addition to writing the results of her microwave cooking research for publication, Miss Davis has reported on such to the Journal Club of the Western Massachusetts Dietetic Association and been an active participant in departmental meetings held by the Nutrition and Food graduate students. She has served on the University Scholarship Committee, the University Summer School Committee, the Undergraduate Curriculum Committee and the Summer School Committee of the School of Home Economics.

Mrs. Jane F. McCullough attended (1) The Annual Meeting of the American Dietetics Association, Cleveland, Ohio, (2) The Fall Conference of the Society for the Advancement of Food Service Research, Chicago, Illinois, (3) The 18th Annual Food Management Seminar, Peabody, Massachusetts and (4) the Spring Conference of the Society for the Advancement of Food Service Research, St. Louis, Missouri. In addition Mrs. McCullough has attended numerous other seminars, planning committee meetings and monthly meetings of the various food service organizations of which she is a member and which were held both in Massachusetts and in the country. In the summer of 1970 she served as Assistant Coordinator. Honors or positions presently held by Mrs. McCullough include (1) member of the Research Activities Committee of the Society for the Advancement of Food Service Research, (2) member of the Board of Directors of the Society for the Advancement of Food Service Research, (3) member of the Board of Directors (Treasurer) and Scholarship Chairman of the Western Massachusetts Branch of the Food Services Executives Association, (4) Chairman, the Scholarship Committee of the School of Home Economics, University of Massachusetts, and (5) member of the Grievance Committee, School of Home Economics, University of Massachusetts.

Dr. K. Padma Umapathy completed the work under her faculty research grant FR-N13-69(1). This research dealt with the effect of certain dietary factors on cholesterolemia. Results are being reported in an article which has been submitted for publication in the Journal of Arterio-Sclerosis. During the year Dr. Umapathy attended a number of conferences and workshops in the area of her nutritional interests including the conference of the North Atlantic Region, College Teachers of Food and Nutrition, Drexel University, Philadelphia, Pa., and a symposium on Nutrition and Metabolism in the Seventies, arranged by the American College of Nutrition and held in Boston, Massachusetts. She was also requested to serve as guest speaker at Framingham State College, the Western Massachusetts Dietetic Association and also Western Massachusetts Home Economics Association meetings.

Professor Harriet Wright has worked diligently throughout the year carrying responsibility as the instructor of a course, Nutrition in Disease, spring, '71, which serves both undergraduate and graduate students, serving as adviser to a number of undergraduate majors, serving as (1) member of the School of Home Economics Study Committee and various sub-committees of the Study Committee,

(2) member of the School's Personnel Committee, (3) member of the University Health Council and sub-committee of the Health Council, (4) Chairman of a Tenure Committee (relative to Dr. Bert's tenure) and (5) guest lecturer in certain School of Home Economics courses. In addition Professor Wright has carried out her major responsibilities in connection with the Home Economics Extension program which includes the Expanded Food and Nutrition Education Program for Low Income Families in the Commonwealth. These responsibilities include. (1) program planning and development of program, (2) in-service education for new professional staff, (3) continuing in-service educational opportunities for other professional staff, (4) in-service education for 300 non-professional staff working in the program with low income families, (5) development of resources, human and material, tools and techniques to support the program at all levels, and (6) continuous evaluation of program and materials. Beyond the University, Professor Wright has spoken at a Nutrition Education Workshop held by the University of Connecticut, served in the development of a new organization - the Massachusetts Committee on Food, Nutrition and Health which serves as an advisory committee to Governor Sargent (at his request), and continues to serve as "ombudsman" to members of the Massachusetts Dietetic Association in 4 Western Massachusetts counties. Professional meetings attended this past year include (1) the American Dietetic Association Meeting in Cleveland, Ohio, (2) the Massachusetts Dietetic Association Meeting on Pediatric Nutrition and Drugs, (3) the Annual Meeting of the American Home Economics Association, Cleveland, Ohio, (4) the Massachusetts Home Economics Meeting, Northampton, and (5) the meeting of the American College of Nutrition of the American Medical Association on Nutrition and Metabolism in the Seventies, Boston, Massachusetts.

2. Major Accomplishments During the Fiscal Year 1970-71

Faculty Positions

The department has been extremely fortunate in filling the two vacancies as reported in the last annual report. Miss Virginia Beal, a nutritionist with the Child Research Council located in Denver, Colorado, and noted nationally and internationally for her research accepted a position on this staff starting second semester. Miss Beal since her arrival in January 1971 has been busy teaching two courses, participating in school and departmental activities, getting some research projects ready for proposal for funds as well as organizing some previous research carried over from her Child Research Council work and prepared for publication. The second vacancy which was filled is that of Departmental Chairman. Dr. Peter L. Pellett, Chairman of the Division of Food Technology and Nutrition, American University of Beirut (Lebanon) comes to the University of Massachusetts highly recommended as an educator, as a researcher, and as an administrator. He will assume duties here on September 1, 1971.

Ph.D. Dissertation

Padhi, Pitambar. Effects of dietary combinations of protein, carbohydrate, fat, vitamins and minerals on serum cholesterol, total lipids, non-protein nitrogen and glutamic-pyruvic transaminase activity. February 1971.

M.S. Reports on Special Problems

Holmes, Ruth W. Trends in nutrition education in schools of nursing in New England. April 1971.

Chen, Linda S.-Y. Nutrient intake of Tai-Ping elementary school children and quality of the protein they consumed. May 1971.

Huang, Jean C. Complication of obesity with diabetes mellitus. May 1971.

3. Future Plans and Needs.

Plans

This department will pursue and complete the revision of its undergraduate curriculum and courses. Consultants will be brought to campus from Universities, the headquarters of the American Dietetic Association, and industry. This revision takes into account the increasing emphasis on socio-economic factors affecting the nutritional status of large sectors of our population; this department is acutely aware of the important contribution it can make to the eradication of hunger and malnutrition. This revision also aims at increasing the usefulness of service courses this department offers to students majoring in other departments.

At the graduate level, this department plans to continue to encourage its students to do research in areas which are closely related to the solution of the all-important problem of hunger and malnutrition. Efforts will be made to participate in interdisciplinary research in environmental quality and health problems.

Needs

This department desperately needs more funds for laboratory and office supplies and expenses; more equipment for teaching and research, more funds for faculty travel and at least one more full-time faculty person whose specialty is in the area of foods and food research. More time needs to be allocated to faculty for the preparation of applications for research grants and in the pursuance of research.

DEPARTMENT OF TEXTILES, CLOTHING AND ENVIRONMENTAL ARTS
Annual Report, July 1, 1970 - June 30, 1971

Submitted By: Sarah L. Hawes, Department Head

PROFESSIONAL ACTIVITIES

Faculty Publications:

Paston, Herbert S. "Puppets are Personalities," School Arts Magazine, November 1970.

"Paper as a Personal Medium," Design Magazine, Winter 1970.

"The Oil Crayon," Design Magazine, March 1971.

Davis, Virginia "Your Clothing $ - Bonded Fabrics," Cooperative Extension, a self-contained teaching unit (including teaching guide, lesson plan, background information and visuals, for use by county Home Economists and leaders. Used in eight counties).

In Progress:

Rainsford, Richard Completed text tentatively entitled History of the Decorative Arts; currently arranging for permission and credits on the 1200 illustrations.
Completed research and article on Casual Learning, submitted for publication.

Randall, Margaret and Sarah Hawes First draft of Textile Laboratory Manual has been tested during the current year; revisions will be made before submitting it for publication.

Exhibits:

Paston, Herbert S. Leverett Artists' Fall Exhibition, Leverett, Mass.; two works exhibited, November 1970.

The Copley Society of Boston Winter Exhibition, Boston; December 1970.

Borgia Gallery, Elms College; February 1971.

Springfield Art League Juried Show; February 1971.

Deerfield Valley Winter Art Association Exhibition, February 1971.

Seventh National Print Exhibition, Springfield College; March 1971.

The Copley Society of Boston Members' Spring Exhibition; May 1971.

Rainsford, Richard Sturbridge Art Show (open).

Connecticut Academy of Fine Arts Annual Exhibition, Wadsworth Atheneum (judged).

Woodstock Art Festival (open; prohibited from judgment as was awarded First Prize in previous show).

Greater Hartford Chamber of Commerce First Annual Outdoor Exhibition (judged).

Research Project:

Davis, Virginia A grant from Celanese Fibers Marketing Company to Hampden County (1970) for training middle income women to teach in disadvantaged neighborhoods in the county. Program began in September with two weeks of training for the women who would do the training. Classes in six areas of the county (primarily greater Springfield) were carried on during the year, with summary sessions and fashion show in early May.
Program proves that middle income women can and will teach low income women successfully. Motivation on the part of class members continues to be the problem.

Other Professional Activities:

The Department was represented at the following professional meetings:

New England District Chapter Meeting of the American Institute of Interior Designers, H. Paston. April and May.

American Institute of Interior Designers, Connecticut Chapter, R. Rainsford.

National Society of Interior Designers, Connecticut Chapter, R. Rainsford.

Symposium on Consumerism and Textile Innovations: Invitational; American Association of Textile Chemists and Colorists, North Carolina, one week, V. Davis.

University Day on Environment: Workshop on "Our Cultural Crisis; The Ecology of Aesthetic Environment," June 2, 1971, R. Rainsford.

Massachusetts and Western Massachusetts Home Economics Meetings (Staff).

National Home Economics Meeting, Denver, Colorado, M. Niederpruem.

Fusing Technology Workshop: University of Massachusetts, S. Hawes, M. Randall.

Apparel Design Forum, School of Family Resources and Consumer Services, University of Wisconsin, M. Randall. July 1970.

Other Professional Accomplishments:

Paston, Herbert S. Co-sponsor of local College Chapter of American Home Economics Association.

Consultant for J.B. Lippincott Company, Publisher; on revision of new edition of The Art of Interior Design and Decoration.

Elected to membership in the American Association of Interior Designers.

Received the National Society of Interior Designer's Educational Foundation Grant: Shopshire Adult College in England. Intensive study of Historic Houses of England.

Rainsford, Richard — Delivered three series of lectures at the University of Hartford; subjects: History of Ancient and Modern Decorative Arts, Graphics for the Interior Designer, Theory of Interior Design.

Furnishings and Architectural Advisor to the Woodstock Historical Society, Connecticut.

Continuing widening investigation of Significant Form (see Bell, Jung) as a result of encouraging results of 1970 investigation. Has widened subjects to include pre-literate children with very positive results. Mr. Rainsford has been offered the possibility of a grant from Jungian Institute but is considering the topic as potential Doctoral Dissertation material as it has obvious educational and environmental use.

In the process of translating the only known copy of Das Buch Der Geheimnisse, a medieval German witchcraft book.

Randall, Margaret — Volunteer 4-H Leader.

Porter, Catharine — On leave of absence.

Hawes, Sarah — Preceptor for Commonwealth Scholar.

Faculty members of the Department were represented on the following School and University Committees:

School:

School Study Committee; S. Hawes.
Dean's Department Heads' Committee; S. Hawes.
Personnel Committee; V. Davis, H. Paston, M. Randall (Secretary).
Personnel Policy Committee; V. Davis, H. Paston.
Personnel Grievance Committee; M. Niederpruem.
Undergraduate Curriculum Committee; S. Hawes (Chairman).
School of Home Economics Graduate Committee; M. Niederpruem (Chairman), H. Paston.
Secretary for Faculty Meetings; R. Rainsford.
Secretary for Departmental Meetings; M. Randall.
School of Home Economics Student-Faculty Committee; M. Randall, R. Rainsford.
Faculty Search Committee; M. Randall (Chairman).
Publicity Committee; R. Rainsford (Chairman).

University:

Discipline Board; S. Hawes.
Master Planning; R. Rainsford -- Sub-committee Space and Academic Standards.
University Affairs; V. Davis.

MAJOR ACCOMPLISHMENTS.

The Textiles, Clothing and Environmental Arts Department offered 27 courses (43 sections) plus 30 Independent Problems during the 1970-71 academic year, servicing 1,070 students who earned 3,206 credit hours of academic work. The Departmental course offerings were limited by the absence of one faculty member who was on leave of absence for the entire year and the sick leave of a 1/6 time Extension member which necessitated the cancellation of a course. The academic program was conducted by 5 1/6 faculty members, one of which served as department head; this minimal staffing resulted in curtailment of course enrollment and the eviction of from 30 to 90 students in many courses each semester. Both staff limitations and physical facilities continue to prevent us from accepting larger enrollment of students.

The current enrollment of majors in the Department is 179 students. During the 1970-71 academic year, 50 students graduated from the major. To date, available information indicates that 76% of the graduates have already obtained positions, are planning on Graduate School or are postponing employment plans due to travel and/or marriage. The current employment picture being what it is, this percentage is an excellent record for the Department.

The Department has started to implement the recommendations contained in the School Study Committee Report on the premise that the Report will be accepted by the Administration.

The first major recommendation that relates to the Department is the change of name of the Department to Environmental Art and Design. This name is most appropriate as we study the National Goals and Guidelines for Research in Home Economics, October 1970, which states:

> "Goal III. Improve the Physical Components of Man's Near Environment; serves as the directive for the departmental program development. The physical components of emphasis here are clothing which is the transitional factor between the individual and his surroundings, and housing which provides the shelter for the family.
>
> The near environment has significant social implications. Housing is the spacial environment in which man exists and interacts, and clothing comprises the most proximal near environment which influences interaction with others and reflects the wider social environment.
>
> The immediate environment should satisfactorily accommodate man and his many activities and interactions. In addition to accommodating man's social needs, it should provide function, comfort, contentment, health, economic, psychological and aesthetic satisfactions.

> The ultimate goal...is to maximize the satisfaction and well-being of individuals and families through increasing knowledge and understanding of man and his immediate environment - his physical, cultural and social milieu. Attention is focused upon the reciprocal relationships between man and the quality of his near environment."

This excerpt illustrates the scope, potential and philosophy of programs, courses and research projects which the Department will develop - initially on a limited basis until additional personnel and resources permit expansion.

Specific Accomplishments of the 1970 - 1971 Academic Year:

1. The Interior Design Sequence has been revised and expanded.

2. Field Experience was established for two advanced Interior Design students.

3. Thirty-four students participated in the Merchandising Field Experience in Boston, Springfield, Hartford and New York City.

4. A Special Education Workshop in Design was presented for all students in Home Economics Education.

5. A three-day Interior Design field trip to New York City in cooperation with the American Institute of Designers and the National Society of Interior Designers was conducted.

6. Field trips were conducted to textile mills, converting industries, etc.

7. A Problems Course in Decorative Arts was initiated using local museums and restorations for study of objects of historical interest. This project has potential of being developed into a "Deerfield Studies" course if successful.

8. Initiated work on special design for "Nutrition Bus" for Expanded Food and Nutrition Program.

9. Tested new Textile I Laboratory Manual authored by M. Randall and S. Hawes; revised course presentation and inaugurated group and/or individual projects to relate technical textile information to consumer oriented problems; 120 students were involved in the project.

10. Step one in developing and testing instrument for placement of students in Apparel Design I. When refined the written test will be but one part of the total placement evaluation. One hundred students were involved in the project.

11. Developing syllabus for Apparel Design II. Revised outline incorporating more aspects of design development; had guest lecturer on history of costume and the ethnic influence; and prepared additional illustrative materials, including selected half-scale fabric samples representing design features.

12. Acquisition of seven machines to replace old equipment.

13. Introduction of interdepartmental Independent Problems with the Department of Management and Family Economics. Four students with interest in Consumer Economics

and/or Social Problems participated in the experiment which took them into low-income ghetto and/or ethnic group situations. This experience clearly illustrates the merit and feasibility of interdepartmental cooperation and new types of "field experiences."

14. A Seminar in Contemporary Cultural Environment was offered on an experimental basis, with plans for incorporating it into a revised program after evaluation.

15. Special sections for advanced work in Decorative Arts, Merchandising, Textiles and Apparel Design were offered under a problems number.

16. One Commonwealth Scholar selected the Department as her major emphasis of study.

17. One student was accepted into the B.D.I.C. program with a staff member as sponsor.

18. Herbert S. Paston, Ed. D., was promoted from Assistant Professor to Associate Professor of Home Economics.

19. Virginia Davis was granted a Sabbatical Leave for the Spring Semester 1972.

The Extension Program:

Clothing Programs were carried in all counties of the Commonwealth with particular emphasis on consumer education and the socio-cultural aspects of clothing. Study groups of four to five sessions each were conducted in five counties. Training in subject matter was provided county home economists and 4-H agents.

Research Project: Celanese Fiber Marketing Company, Hampden County, is described earlier in the report.

The study-research series on Home Heritage was continued. Hampden County (Russell) research was part of the annual town report. The Duke group will do research which will be a part of the 300th anniversary celebration on the Island. Plymouth will present a report of their research at County Spring Leaders' Day.

In-service training for Program Assistants was taught in regional meeting for use in their work with low-income families.

MAJOR NEEDS

The major needs of the Department continue to be personnel, physical space and financial support.

Personnel:

Department Head - a candidate with a doctoral degree, respected , with national reputation, experience in administration and in some aspect of the field who would be qualified to direct the undergraduate program, develop a graduate program, initiate research projects and solicit grants for funding and who will be inspirational to and respected by the faculty and the students.

An additional faculty member with a background in the area of consumer economics of clothing and textiles to permit expansion of this aspect of the program is also needed.

As stated in the quotation from "Goals and Guidelines" which was referred to earlier in this report, the physical environment of clothing and shelter will be the major emphasis of the Department. In selecting Interior Design as the major emphasis of the "shelter" aspect of the program, it is important that the School be able to gain accreditation in the field. Within this option, provisions can be made for students with interest in Business Procedure and Sales, Historic Work (restoration, preservation, curatorical work) and Technical Skills (drafting, rendering, model-making).

The Department needs three full-time professionally and educationally qualified new faculty members to forward this program. These new faculty members should have a good background in Interior Design and Housing, including the ability to teach theory of light and color for interiors, basic design for designers, freehand drawing and perspective, drafting and presentation (graphics), materials and building construction, construction and building systems, professional procedures, architectural structure and furniture construction.

Studio space will be needed for expansion of this program. A room, equipment (drafting tables, cabinets, glass viewing stage for instruction in perspective, specialized library area, instructional samples in perspective and set of grids for same), lighting equipment, furniture examples, etc. for demonstration purposes, as well as budget for travel and guest honorariums will be essential.

The Decorative Arts slide collection will need glass covers for protection and preservation.

A full-time secretary is an absolute necessity.

Office space, work areas and storage facilities are urgently needed for the present program and will become more important needs as the program expands.

SLH:kmc:6/14/71

ANNUAL REPORT

Labor Relations and Research Center

FISCAL YEAR ENDING JUNE 30, 1971

University of Massachusetts

Amherst

INTRODUCTION

Fiscal 1971 was a traumatic year for the Labor Relations and Research Center. With the unexpected death of Professor Ben B. Seligman, the director of the Center, we suffered a loss impossible to measure.* Professor Seligman's contributions, as first director, in the academic, research, public service and extension areas as well as his national reputation are going to be most difficult to duplicate. His encouragement of the staff and the students as well as his ability to delegate responsibility and authority were major strengths for the Center. In the formal, printed report of the Center, some of the written tributes of his associates will be printed.

In addition, as of October 23, 1970, and based on a Board of Trustees resolution of that date, the Institute for Labor Affairs was set up in the University System office in Boston. To this new institute were assigned the extension functions of the LRRC. In addition, student field work assignments were made with the cooperation of the Institute staff. This report will encompass only those activities of Mr. Joseph Cass, Director of the new Institute, and Mr. Joseph Lanzilli, Field Representative, through October 22, 1970. Based on experience and on the aforementioned trustee resolution, a working relationship between LRRC and ILA has been developed and has worked effectively in carrying out the objectives of both organizations. The LRRC budget reflects the budget of both.

*Professor Seligman's wife Libby died in January 1971 after a prolonged illness. Her participation in the Center's work on an informal basis was both meaningful and important.

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I.

APPROPRIATIONS

Fiscal Year	Total Appropriation
1969-1970	$191,472
1970-1971	$170,773

II.

PERSONNEL

1969-1970	July-Oct. 22, 1970	Oct. 22-June 30, 1971
Director*	Director*	Acting Director**
Assistant Directors (2)	Assistant Directors (2)	Research Coordinator
Field Representative	Field Representative	Principal Clerk
Research Coordinator***	Research Coordinator***	Senior Clerk, Steno
Principal Clerk	Principal Clerk	Librarians (2) (Part-time)
Senior Clerk, Steno (2) (1 - Amherst Office) (1 - Boston Office)	Senior Clerk, Steno (2) (1 - Amherst Office) (1 - Boston Office)	Research Assistant (6) (Students, Part-time)
Junior Clerk, Typist (Worcester Office)	Junior Clerk, Typist (Worcester Office)	Clerical Assistant (1) (Part-time)
Librarians (3) (Part-time)	Librarians (2) (Part-time)	
Research Assistants (6) (Students, Part-time)	Research Assistants (6) (Students, Part-time)	
Clerical Assistants (3) (Part-time)	Clerical Assistant (1) (Full Time)	

*Professor, Economics
**Harvey L. Friedman, Assistant Professor of Government
***Lecturer in the School of Business Administration

III.

STUDENTS: GRADUATE AND EXTENSION

A. Majors (M.S. in Labor Studies Program):

SEMESTER	NO. OF STUDENTS
1st. (September 1970)	26
2nd. (February 1971)	28

B. Courses Taught by LRRC Staff: Academic, Graduate Level

COURSE		NO. OF STUDENTS	CREDITS	TOTAL SCH*
LR 700	Research Practicum, I,II - Mr. Brooke	21	6	126
LR 710-1	Seminar in Labor - Prof. Friedman	10	3	30
LR 710-2	Seminar in Labor - Prof. Friedman	9	3	27
LR 710-3	Readings - Prof. Friedman	3	3	9
LR 710-4	Readings - Prof. Seligman**	1	3	3
LR 764	Gov't. of Union Prof. Friedman	8	3	24
Govt 222/522	Mass. Politics Prof. Friedman	23	3	69
	TOTALS	75	--	288

*Student Contact Hours
**Prof. Friedman took over class after Prof. Seligman's death.

C. Labor Education Extension: FY 1971:

Boston-Worcester - 7/1-10/22/70: Total registered participants = 606

Amherst - 7/1/70-6/30/71: Total registered participants = ~~1,000~~ 820

Total registered participants = ~~1,606~~ 1,426

Total different programs = ~~21~~ 24

IV.

PROFESSIONAL ACTIVITIES

A. Publications

Ben B. Seligman, Director

Books

Molders of Modern Thought.(editor) Quadrangle: Chicago, 1970. 256 pages.

The Potentates: Business and Businessmen in American History. Dial Press: New York, 1970. 401 pages.

Contributing Author

Encyclopedia Americana. Grolier Society: New York, 1970, Vol. 12 on "Ragnar Frisch," p. 100; Vol. 26: "Jan Tinbergen," p. 771; "Richard Henry Tawney," p. 316.

Article

"Philosophic Perspectives in Economic Thought," Journal of Economic Issues, Vol. V No. I, March 1971, pp. 1-24.

Review

"Labor's Days of Travail and Triumph," an essay review of four books on American trade unions, Saturday Review, September 5, 1970, pp. 19-22. Issued as Labor Center Reprint No. 25.

Harvey L. Friedman, Acting Director

Contributing Author

Encyclopedia Americana. Grolier Society: New York, 1970, Vol. 26 on "Benjamin Tillet," p. 746;"Daniel J. Tobin," p. 804; "Teamsters' Union," p. 351.

Encyclopedia Americana Annual (1971). Grolier Society: New York, 1971, "A New Era for Postal Service," p. 555; "U.S. Post Office," pp. 554, 556.

Co-Author, Research Reports

An Inter-Union Pre-Retirement Training Program, Administration on the Aging, Department of Health, Education, and Welfare, 44 pages plus Appendix, 37 pages, 1970.

Planning for Retirement--How to Prepare and Present a Pre-Retirement Program, Administration on Aging, Department of Health, Education and Welfare, 8 pages, 1970.

Research Note

Report of LRRC and Its Research Activities, Industrial and Labor Relations Review, Spring 1971, pp. 500-501.

Joseph J. Cass, Assistant Director

Article

"Have Course Will Travel," Boston Herald Labor Day Magazine, September 7, 1970.

B. Contract Research Grants Sponsored by LRRC

FUNDED:

1. Trade Unions and Poverty in New England

Training project refunded by Office of Economic Opportunity to train trade unionists in community action programs.

$204,000: Completed November 30, 1970.
Prin. Invest.,Ben B. Seligman
Dir. LRRC

2. Inter-Union Pre-Retirement Training Program

Administration on Aging, U.S. Dept. of Health, Education and Welfare to develop pre-retirement programs on an inter-union basis.

$41,256: 2nd of 2 years: Completed September 30, 1970.
Prin. Invest.,Harvey L. Friedman
Asst. Dir., LRRC

3. National Manpower Policies in O.E.C.D. Countries

Research grant funded by Manpower Administration. U.S. Dept. of Labor to report on manpower policies in O.E.C.D. countries.

$22,854: Extended to December, 1971.
Prin. Invest., Solomon Barkin
Dept. of Economics

4. Planning Grant

Funded by the Manpower Administration, U.S. Dept. of Labor to plan a series of papers and studies to be presented to a seminar to discuss the interrelationship between economic and manpower policy.

$14,904: Extended to December 30, 1971.
Prin. Invest., Solomon Barkin
Dept. of Economics

C. Faculty Research Funded by LRRC

Prof. George T. Sulzner, Dept. of Government and Prof. Thomas M. Love, Dept. of Economics "Political Influences on Public Collective Bargaining in Selected Massachusetts Cities" (Study to be published by the Industrial Relations Review, Berkeley)	$2,850
Prof. Gerald Braunthal, Dept. of Government "The Politics of the German Free Trade Unions during the Weimar Period"	400
TOTAL	$3,250

D. University Committees

Ben B. Seligman, Director:

Economics Education Committee
U/Mass Press Committee
Environmental Quality Committee (Subcommittee on Structure)
Agricultural Extension Committee on Environmental Concerns

Harvey L. Friedman, Acting Director:

Faculty Committee on Faculty Affairs
  Chairman, Sub-Committee on Collective Bargaining
University Broadcasting Council
Chairman, Faculty Committee on Continuing Education
Vice-Chancellor for Public Affairs Search Committee
School of Education Doctoral Committees (3)
School of Business Administration Doctoral Committee (1)
Department of Government Independent Research Committee (1)
Department of Agricultural Economics Masters Committee (1)

Milton Brooke, Research Coordinator:

Personnel Management Curriculum Revision (Ad Hoc Committee)
  School of Business Administration
Secretary, Review Committee, Evaluation of LRRC Program

E. Professional Activities: Paper (P); Speaker (S); Attended (A)

Professor Friedman

July 5	1970	Amherst Sunday Morning Group (on discrimination in trade unions) (S)
Aug. 7	1970	Opening of Lincoln Campus Center (A)

Aug. 12	1970	State Department of Education Collective Bargaining Task Force, Auburn, Mass. (A)
Aug. 30	1970	Maine Higher Education Authority, Augusta, Maine (on a model state employee collective bargaining statute) (S)
Sept. 6	1970	ULEA Executive Board Meeting, New York (A)
Sept. 9-11	1970	Mass. State Labor Council, AFL-CIO Annual Convention, Boston (A)
Sept. 25	1970	O.E.O. Advisory Council Meeting, Amherst (A)
Sept. 26	1970	Western Mass. AFL-CIO Scholarship Conference, Chicopee (on the generation gap in trade unions) (S)
Oct. 15	1970	State University of New York at Albany, Graduate School of Public Affairs Committee (on the academic teaching of public sector bargaining) (A)
Oct. 20, Dec. 17 Mar. 9	1970 1971	State Employees Collective Bargaining Review Commission Meetings, Boston (A)
Nov. 4	1970	Zonta International, Northampton (on the national and state elections) (S)
Nov. 10, Dec. 8 Jan. 12	1970 1971	Task force preparation meetings for the White House Conference on the Aging, Boston (A)
Nov. 10	1970	Western Mass. Physical Therapist Association, Northampton (on professional collective bargaining) (S)
Nov. 12	1970	U.S. Civil Service Commission, Boston (on Federal Collective Bargaining) (S)
Nov. 21	1970	Legislators' Day, Amherst (A)
Dec. 1	1970	U.S. Civil Service Commission, Boston (on Federal Collective Bargaining) (S)
Dec. 22-29	1970	I.R.R.A. Meetings, Detroit (A)
Jan. 11-14	1971	Galaxy Conference (AFL-CIO) on Trade Union Apathy, St. Louis (A)
Jan 21	1971	Legislative Conference, Amherst (A)

Feb. 6,7	1971	American Newspaper Guild, National Wire Service Conference, New York (on Research for Action) (S)
Feb. 19,20	1971	Nursing Home Administrators' Conference (on collective bargaining) (S)
Feb. 26	1971	Federal City College Conference on Labor Education, Washington (A)
March 16	1971	Conference on the Elderly, Fitchburg (on pre-retirement training) (S)
April 18	1971	Mass. Association of School Administrators (on the role of principals in teach CB) (S)
April 28-30	1971	ULEA national meetings (on the role of trade unions in community activities) (S)
May 5	1971	I.R.R.A. Joint Meeting, Amherst (A)
May 6	1971	Social Security Administration, Woodstock, Vermont (on Federal Collective Bargaining) (S)
May 8	1971	Young Peoples Socialists League (Youth and the Labor Movement) (S)
May 26	1971	Greenfield Community College Conference on the Elderly (on pre-retirement training) (S)
June 2	1971	Letter Carriers Branch 46, Springfield (National Labor Relations Act and Union Bylaws) (S)
June 15	1971	Civil Service Commission, Boston (Federal Collective Bargaining - The Second Stage) (S)
June 20	1971	State-wide Conference on the Aging, Framingham (Pre-retirement Training - The Clouds Lighten) (S)

Mr. Joseph J. Cass

Sept. 9-11	1970	AFL-CIO Convention, Boston (S)
Sept. 25	1970	O.E.O. Advisory Council, Amherst (A)
Oct. 15	1970	Meeting of Advisory Council of Mass. Department of Education, Bureau of Curriculum Innovation, Title III, Newton (A)

Mr. Joseph P. Lanzilli

July 10	1970	Meeting with Shrewsbury High School teachers (S)
Aug. 25	1970	Meeting of Worcester Youth Group
Sept. 7	1970	Annual meeting of Worcester Labor Council, Northboro (A)
Sept. 9-11	1970	AFL-CIO State Convention, Boston (A)
Sept. 17	1970	Meeting, Drug Abuse Coalition Information/Education Committee, Worcester (A)
Sept. 25	1970	O.E.O. Program Advisory Committee Meeting, Amherst (A)
Sept. 26	1970	Annual meeting, I.B.T.W., Local #2, Fitchburg (S)
Oct. 14	1970	Meeting with United Appeal leaders, Worcester (S)
Oct. 14	1970	Meeting with Shrewsbury High School teachers (S)
Oct. 19	1970	Meeting, Drug Abuse Coalition, Worcester (A)
Oct. 21	1970	Meeting, United Appeal Progress Report Committee, Worcester (S)

Mr. Milton Brooke

Dec. 14	1970	25th Anniversary, New York State School of Industrial and Labor Relations, Cornell University (A)
April 28-30	1971	Annual Meeting, University Labor Education Association, Washington, D. C. (A)

F. Other Professional Activities

Professor Seligman

Federal Research:

Principal Investigator, OEO New England Trade Union Training Project
Consultant, "Inter-Union Pre-Retirement Project"

Other Activities:

Consultant, U.S. Department of Labor on Wage Hour matters
Consultant, Office of Education on research proposals

Professional Membership and Offices:

Association for Evolutionary Economics, President
Western New England Economics Education Council, Trustee
Board of Directors Hampshire Housing Development Corporation, Member
Executive Board, Industrial Relations Research Assn., Member

Professor Friedman

Federal Research:

Principal Investigator, Administration on the Aging, "Inter-Union Pre-Retirement Project"
Consultant, OEO New England Trade Union Training Project

Private Research:

Resource Contributor, Ford Foundation Educational Leadership Project, School of Education
Coordinator of possible Ford Foundation--American Newspaper Guild--LRRC project on "Trade Union Apathy"

Government Support:

State Commission on State Employee Collective Bargaining (Chairman, Subcommittee in Management Relations)
Task Force on Collective Bargaining, State Board of Education
Task Force on Training (Preparation for the White House Conference on the Elderly)

Consultative Services:

To: Unions, governmental groups, religious orders, joint labor-management groups, etc.
On: Collective bargaining, labor-management relations, pre-retirement training, consumer problems, inter and intra-governmental relations, practical politics, etc.

University Support:

SCUP conference for AFL-CIO representation, Aug. 11
School of Nursing lecture on "Collective Bargaining for Nurses", Oct. 29
School of Education Leadership Training Program, Amherst, March 15
Dept. of Government Political Parties course on the role of state committees, March 30
Wayne Emerson, School of Education, Doctoral Oral Examination, April 1
Air Force ROTC Class on collective bargaining in the military service, April 20
Water Resources Graduate Seminar on the state legislature and water resources, April 23

Professional Memberships and Offices:

Industrial Relations and Research Association
University Labor Education Assoc. (Secretary-Treasurer)
Amherst Human Relations Council
Committee on Labor Management Relations (Boston Bar Assoc.)
Arbitrator, National Panel, American Arbitration Assoc.
Chairman, Laborers' International Local #596 Scholarship Committee
NE Political Science Association

Mr. Cass

Federal Research:

Consultant, OEO New England Trade Union Training Project
Member, Advisory Council, State Board of Education, HEW grant, ESEA, Title III Project
Member, Advisory Council, State Board of Education, Bureau of Vocational Education, HEW grant, ESEA, Title I Project

Professional Memberships and Offices:

Catholic Labor Guild (Advisory Council)
College Scholarship Award Committee, ILGWU

Mr. Lanzilli

Federal Research:

Consultant, New England OEO Trade Union Project
Consultant, Inter-Union Pre-Retirement Program

Other Activities:

Consulted with: Director, Institute of Industrial Relations, Holy Cross College, Worcester, Sept. 14, 1970
Officers, United Papermakers and Paperworkers Local #882, Pittsfield re Pensions and Insurance, Sept. 18, 1970

President, United Papermakers and Paperworkers Local #882 and Worcester labor attorney, Sept. 28, 1970

Secretary, Worcester Labor Council and Director of Worcester State Hospital, Oct. 5, 1970

Professional Memberships and Offices:

Industrial Relations Research Association
Worcester Area Cooperative Area Manpower Planning System (CAMPS)
University Labor Education Association (ULEA)
Drug Abuse Coalition Executive Board
Drug Abuse Coalition Information/ Education Committee
Dynamy Advisory Committee

Mr. Milton Brooke

Professional Memberships and Offices:

Industrial Relations Research Association
University Labor Education Association
American Association of University Professors

Other Activities:

In-House Research: A comprehensive study of the Massachusetts workmen's compensation law and its administration, which will be submitted for publication in a professional journal

Consulted with: Adult Education Association and Public Personnel Association, July 1, 1970
Model Cities Agency, Springfield, Mass., July 23, 1971
Officials of the Industrial Accident Board, Massachusetts, and U.S. Department of Labor officials, Boston, Sept. 3, 1970
Officials of the U.S. Bureau of Labor Statistics, New England Region and New York Public Employment Relations Board, Oct. 8, 1970
Officials of Industrial Accident Board, Boston and Librarian, State House, Boston, Dec. 1, 1970
Edward Corsi, Director, Labor Management Relations Institute, Pace College, New York, New York, and Regional Director, Wage and Hour Division, U.S. Department of Labor, Dec. 11, 1970
Representatives of U.S. Commission on Civil Rights and Massachusetts State Advisory Committee on Civil Rights, Feb. 18, 1971
Attorney Laurence Locke, Boston, Chairman, Workmen's Compensation Subcommittee, Massachusetts Bar Association, March 25, 1971
U.S. Department of Labor officials, Washington, D.C. re: occupational health and safety, workmen's compensation, and training of foreign trainees programs, April 28, 1971

V. ACCOMPLISHMENTS

During fiscal 1971, despite the tragic circumstances outlined in the introduction, the work of the Labor Relations and Research Center continued to expand albeit at a reduced rate.

Degree Program

The number of students in the degree program totalled 33 during the 1971 fiscal year (31 fully matriculated and 2 special part-time students). In June 1970, 4 students graduated with Master of Science in Labor Studies degrees. In May 1971, 19 students received the M.S. degree with 2 more to qualify in August 1971. Completed applications for admission reached a high mark of 53. Of these, 25 were admitted for September 1971 with an estimated enrollment of 21 anticipated based on acceptances returned.

The program was most successful --beyond all projected possibilities-- in placing 19 students in meaningful internships. A majority worked with unions, some of whom had never before had a college student working for them. Some of the laudatory comments by officials such as Joseph Keenan, Secretary-Treasurer of the International Brotherhood of Electrical Workers and Carl Megel, Legislative Director and former National President of the American Federation of Teachers are in the Labor Center files. In addition, work with the Bureau of Labor Statistics, the New York State Department of Labor and the New York City Human Resources Administration was equally well received. The practical experience combined with academic year course work and field work makes the LRRC academic program unique.

Second-year M.S. in Labor Studies students are required to participate in the labor education extension program as part of their field work, although they may opt for a master's thesis. Individual students assigned to the Institute of Labor Affairs were involved in various phases of the planning, development of materials and, in some cases, instruction of courses and conferences. Staff evaluations of the students' work, which become part of the permanent record, indicate an increased number of graduates who show both interest and ability in the labor education field. Practical application of academic skills is afforded in the field work portion of the program. This has been expanded to include assignment of students to work directly with staff of unions.

Research

Professor Solomon Barkin, research associate in the LRRC, continued his research project on manpower policies which is funded by the U.S. Department

of Labor in the amount of $22,854, and sponsored by the LRRC.

Professor Friedman was Principal Investigator for the Inter-Union Pre-Retirement Training Program funded by the Administration on Aging, Department of Health, Education and Welfare in the amount of $21,256. This program demonstrated methods for meeting the needs of pre-retirees on an inter-union cooperative basis. Hundreds of requests for the Pre-Retirement pamphlet and the final report were received. In addition, Professor Friedman and Jeff Abrams, a graduate student, were named to the Governor's Task Force in Preparation for the White House Conference on the Aging.

The LRRC's complement of research associates includes Professors Stanely Young, Tim Bornstien and Max Wortman (School of Business Administration), Curt Tausky (Sociology), Solomon Barkin (Economics), George Sulzner (Government) and George Levinger (Psychology). In addition, Professors Sulzner's and Love's research project, sponsored by the LRRC, produced a well-received paper which is being published in the Industrial Relations Review (Berkeley).

Extension

As noted in the introduction, extension ceased to be a function of the Center on October 23, 1970 except for programs in the planning stage to be conducted by Professor Friedman. Despite that, the staff conducted between July 1 and October 23, 1970, 14 programs. In addition, after October 23rd, Professor Friedman conducted 10 programs.

Perhaps the most significant accomplishment of the Center occurred at the end of the school year. Despite the shortage of jobs in the entire economy, the LRRC's 19 graduates all were placed in jobs. Nine were with unions, six with government agencies, 3 with miscellaneous labor-oriented agencies and the first woman graduate married a graduate of the previous year; it is anticipated that after she relocates she will be placed in a part time position.

Library

The library again this year employed two skilled librarians on a part time basis and is continuing its expansion.

Publications

The LRRC publications program continued during the year with the issuance of the following:

Reprint No. 21: "Wage Incentive Problems in Arbitration", Solomon Barkin.

" " 22: "Trade Unions Face A New Western Capitalistic Society", Solomon Barkin.

" " 23: "Labor's Days of Travail and Triumph", Ben B. Seligman.

" " 24: "Retraining and Job Redesign", Solomon Barkin.

" " 25: "Resolution of Conflict", Solomon Barkin.

" " 26: "The Scandinavian Experience", Solomon Barkin.

" " 27: "Antecedents of Modern Thought", Ben B. Seligman.

" " 28: "Is Fiscal Policy Dead?", Harold Wolozin.

" " 29: "Relative Severity of Employer Unfair Labor Practices" John Blackman.

LABOR RELATIONS AND RESEARCH CENTER

Labor Education Extension Program

July, 1970 - June, 1971

Professor Harvey L. Friedman

S.E.I.U. Summer Leadership Institute, U/Mass., Amherst, Mass. July 27-31, 1970. Registrants 30.

A.F.S.C.M.E. Summer Leadership Institute, U/Mass., Amherst, Mass. August 17-21, 1970. Registrants 22.

I.U.E. #254, Pittsfield, 6-week course, "Stewards Training", September 15-October 20, 1970. Registrants 19.

A.F.T.E. #101, North Adams, 4-week course, "Education for New Members", September 17-October 15, 1970. Registrants 20.

JOINT ARBITRATION CONFERENCE on Public Sector Arbitration, U/Mass., Amherst, Mass. October 17, 1970. Registrants 35.

A.F.T. #1359, Springfield, 4-week course, "Building Representatives Training", October 29-December 2, 1970. Registrants 12.

S.E.I.U. #576, Worcester, one day conference, "Public Sector and Collective Bargaining", October 30, 1970. Registrants 22.

JOINT ARBITRATION CONFERENCE on Public Sector Arbitration, Bridgewater, Mass. November 14, 1970. Registrants 40.

PIONEER VALLEY, AFL-CIO Consumer Conference on Public Sector Arbitration, Springfield, Mass. December 5, 1970. Registrants 60.

JOINT ARBITRATION CONFERENCE on Public Sector Arbitration, Burlington, Mass. December 12, 1970. Registrants 55.

SOUTHEASTERN MASS. UNIVERSITY A.F.T., one day conference on University Collective Bargaining, Dartmouth, Mass. January 5, 1971. Registrants 10.

NATIONAL ASSOCIATION OF LETTER CARRIERS, AFL-CIO, U/Mass., Amherst, Mass., three day conference on the new postal collective bargaining, January 22-24, 1971. Registrants 340.

A.F.T.E. Northeast Leadership Training Institute, U/Mass., Amherst, Mass. May 14-16, 1971. Registrants 45.

A.F.S.C.M.E. #1776, U/Mass., Amherst, Mass., 4-week course, "Stewards Training Course", April 26-June 7, 1971. Registrants 35.

MENTAL HEALTH CONFERENCE, Burlington, Mass., with State, AFL-CIO and National Institute of Mental Health. June 19, 1971. Registran

Labor Education Extension Program

July 1, 1970-October 22, 1970

Joseph J. Cass

I.U.E. Local #201, Lynn, 4-week course, "Leadership Training", July 13-August 3, 1970. Registrants 20.

I.U.E. Local #201, Lynn, 4-week course, "Leadership Training", August 10-31, 1970. Registrants 28.

I.L.G.W.U. NORTHEAST DEPARTMENT, Brettonwoods, New Hampshire, weekend conference, "The Economy 1970", August 14-16, 1970. Registrants 275.

I.U.E. Local #201, Lynn, 4-week course, "Leadership Training", September 14-October 5, 1970. Registrants 32.

SOUTHEASTERN NEW ENGLAND DISTRICT, ILGWU, weekend conference, "The Economy and the Union Member", October 10-12, 1970. Registrants 160.

Joseph P. Lanzilli

COMMUNICATION WORKERS OF AMERICA, Northeast Region, week-long summer school, "Human Relations, COPE, Labor Economics, CWA Today", July 19-24, 1970. Registrants 35.

SERVICE EMPLOYEES INTERNATIONAL, Local #495, Worcester, 8-week course, "Contract Administration", September 10-October 29, 1970. Registrants 22.

EMPLOYEES UNIONS OF COLONIAL PRESS, Clinton, 7-week course, "Labor Law and Labor Economics", September 14-October 26, 1970. Registrants 18.

LOCAL UNIONS IN CENTRAL MASSACHUSETTS, PRESIDENTS & VICE PRESIDENTS, 8-week course, "Public Speaking and Parliamentary Procedure", September 22-November 10, 1970. Registrants 16.

VII. FUTURE PLANS AND NEEDS

Because of the uncertainity in terms of the directorship at this writing of the report, the projected report of the special committee set up to study the Center's programs and the possibility of curriculum reform, it is impossible to project the needs of the Center at this time.

UNIVERSITY OF MASSACHUSETTS
AMHERST · BOSTON · WORCESTER

MEDICAL SCHOOL
OFFICE OF THE DEAN
419 BELMONT STREET
WORCESTER, MASSACHUSETTS 01604

June 10, 1971

TO: Mr. R. J. McCartney, Secretary

FROM: Lamar Soutter, M.D.
Dean, Medical School

SUBJECT: Report of the University of Massachusetts Medical School
For the Fiscal Year Ending June 30, 1971

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1. Appropriation for the

Fiscal Year	Budget	Capital Outlay
1968-69	$339,200.00	$231,000.00
1969-70	750,000.00	70,000.00
1970-71	$1,625,205.00	$600,000.00

2. Personnel - September 1968

Deans, two
Executive Assistant, one
Faculty, two
Engineer, one
Librarian, one
Cataloguer, one
Library Assistant, one
Secretaries, five
Junior Clerks, three

September 1969

Deans, one
Associate Deans, two
Executive Assistant, one
Faculty, three
Engineers, two
Librarian, one
Cataloguer, one
Library Assistant, one
Laboratory Technicians, three
Secretaries, five
Junior Clerks, two
Fireman-Janitor, one

2. Personnel - Continued

September 1970	Deans, one Associate Deans, two Executive Assistant, one Registrar, one Librarian, one Faculty, ten Engineers, two Director of Materiel, one Manager of Purchasing, one Professional Technician, one Buyer, Materiel, one Director of Planning & Development, one Manager, Materials Handling, one Cataloguer, one Public Services Librarian, one Library Assistant, one Electrician, one Fireman-Janitor, one Secretaries, twelve Junior Clerks, two

3. Organizational Chart: Same as 1969-70

4. Students or clientele served: Sixteen

5. Faculty publications, research grants, research projects, and other professional activities:

Faculty Publications are appended.

Faculty Research Grants:

R. W. Butcher, Ph.D.	National Institutes of Health	"Control of Cyclic AMP Levels"
Francis J. Chlapowski, Ph.D.	National Institutes of Health	"The Origin and Specialization of Membranes"
Sam L. Clark, Jr., M.D.	National Science Foundation	"Endocrine Function of the Thymus"
	National Institutes of Health	"Neonatal Adaptation and Immunological Maturation"

Fredric S. Fay, Ph.D.	Massachusetts Heart Association	"Ductus Arteriosus-O_2 Sensitivity"
	National Institutes of Health	"Generation and Regulation of Froce in Smooth Muscle"
Sandy C. Marks, Jr., Ph.D.	National Science Foundation	"Pathogenesis of Osteopetrosis in Rats"

Faculty Professional Activities:

R. W. Butcher, Ph.D.	Senior Scientist (Affiliate) Worcester Foundation for Experimental Biology Shrewsbury, Massachusetts
	American Physiological Society
	Member of Advisory Board for publication of a series on "Advances in cyclic nucleotide research"
	Member, Pharmacology-A Study Section National Institutes of Health
Sam L. Clark, Jr., M.D.	Member, Executive Committee of American Association of Anatomists
	Member, Association of Anatomy Chairmen, Executive Committee
	Chairman-Elect, Council of Academic Societies
	Member, Executive Council of the Association of American Medical Colleges
	Participation in the accreditation of medical schools by the Liaison Committee of the Council of Medical Education of American Medical Association and the Executive Council, Association of American Medical Colleges.

Hugh S. Fulmer, M.D.	Central Massachusetts Regional Hospital Planning Council (Board of Directors)
	Worcester County Health Association (Board of Directors)
	Child Abuse Subcommittee (Community Services)
	Comprehensive Health Planning Council (Consultant)
	Consumer Needs Committee (Comprehensive Health Planning Council)
	Drug Abuse Task Force (Community Services Subcommittee on Treatment/ Rehabilitation)
	Laurel Clayton Community Health Task Force
	University of Massachusetts Air Pollution Control Advisory Committee
	Worcester Consortium for Higher Education (Model Cities Subcommittee)
	Worcester Southern District Medical Society
	Environmental Control Committee of the Massachusetts Public Health Association
	Harvard Public Health Alumni Association (Vice President)
	Public Affairs Committee of the Easter Seal Society
	Subcommittee on Curriculum for the Teachers of Community Medicine course of the Harvard School of Public Health
	The Advisory Committee on Planning (Harvard School of Public Health)
	Subcommittee of the Massachusetts Advisory Committee (Tri-State Regional Medical Program)

Richard A. MacDonald, M.D.	Lecturer in Pathology, Boston University School of Medicine October, November, 1970 February, March, 1971.
	Member, President's Committee on the Future University of Massachusetts
	Editorial Consultant on Pathology Texts, Grune and Stratton Publishers, New York, N.Y.
	Chairman, Radioisotope Committee, University of Massachusetts Medical School, Worcester
Richard H. Saunders, Jr.,M.D.	Member, Worcester District Medical Society
	Member, Massachusetts Medical Society
Lamar Soutter, M.D.	President, Massachusetts Medical Society
	President, Easter Seal Society for Crippled Children and Adults of Massachusetts, Inc.
John F. Stockwell	Member of a planning committee for evaluating the need for an educational program in administration of health and hospital facilities.
	Member, Board of Directors, Comprehensive Health Planning Council of Central Massachusetts
	Member, Hospital Planning Council, Massachusetts Hospital Association
	Chairman, Evaluation Committee of New England Hospital Assembly

6. Major accomplishments of the Medical School during fiscal 1970-71.

We opened in September, 1970, the first State operated medical school in Massachusetts. It is the third school licensed to operate in Worcester and the twentieth in the State.

We completed affiliation agreements with two hospitals in Worcester and are working on those with two others.

We have increased the size of our faculty to 54, most of whom are unpaid.

Our power plant and medical science building are under construction.

7. Special projects or programs.

We have opened the only large medical library in the State outside of Boston, with privileges of using it available to all physicians, nurses, and others who have a legitimate need for its services.

We have inaugurated a community health program of special education to orient students to their responsibilities in the community as physicians. This program is unique.

8. Future plans and needs.

We need a teaching hospital (400 beds, 100,000 outpatient visits a year) very badly.

We need to have the ceiling on faculty salaries removed.

We need many more clinicians on our faculty.

Respectfully submitted,

Lamar Soutter, M.D.
Dean

PUBLICATIONS

R. W. Butcher, Ph.D.

Research Papers

1. Butcher, R.W., and Sutherland, E.W., Adenosine 3',5'-phosphate in biological materials. I. Purification and properties of cyclic 3',5'-nucleotide phosphodiesterase and use of this enzyme to characterize adenosine 3',5'-phosphate in human urine. J. Biol. Chem., 237:1244 (1962).

2. Butcher, R.W., Ho, R.J., Meng, H.C., and Sutherland, E.W., Adenosine 3',5'-monophosphate in biological materials. II. The measurement of adenosine 3',5'-monophosphate in tissues and the role of the cyclic nucleotide in the lipolytic response of fat to epinephrine. J. Biol. Chem., 240:4515 (1965).

3. Robison, G.A., Butcher, R.W., Øye, I., Morgan, H.E., and Sutherland, E.W., The effect of epinephrine on adenosine 3',5'-phosphate levels in the isolated perfused rat heart. Molecular Pharmacology, 1:168 (1965).

4. Handler, J.S., Butcher, R.W., Sutherland, E.W., and Orloff, J., The effect of vasopressin and of theophylline on the concentration of adenosine 3',5'-phosphate in the urinary bladder of the toad. J. Biol. Chem., 240:4524 (1965).

5. Sutherland, E.W., Øye, I., and Butcher, R.W., The action of epinephrine and the role of the adenyl cyclase system in hormone actions. Recent Progress in Hormone Research, 21:623 (1965).

6. Bueding, E., Butcher, R.W., Hawkins, J., Timms, A.R., and Sutherland, E.W., The effect of epinephrine on adenosine 3',5'-phosphate and hexose phosphates in intestinal smooth muscle. Biochim. et Biophys. Acta, 115:173 (1966).

7. Butcher, R.W., Cyclic 3',5'-AMP and the lipolytic effects of hormones on adipose tissue. Pharmacological Reviews, 18:237 (1966).

8. Butcher, R.W., Sneyd, J.G.T., Park, C.R., and Sutherland, E.W., Effect of insulin on adenosine 3',5'-monophosphate in the rat epididymal fat pad. J. Biol. Chem., 241:1652 (1966).

9. Exton, J.H., Jefferson, L.S., Butcher, R.W., and Park, C.R., Gluconeogenesis in the perfused liver. The effects of fasting, alloxan diabetes, glucagon, epinephrine, adenosine 3',5'-monophosphate and insulin. Am. J. Medicine, 40:709 (1966).

Research Papers - Dr. Butcher

10. Marsh, J.M., Butcher, R.W., Savard, K., and Sutherland, E.W., The stimulatory effect of luteinizing hormone on adenosine 3',5'-monophosphate accumulation in corpus luteum slices. J. Biol. Chem., 241:5436 (1966).

11. Butcher, R.W., and Sutherland, E.W., The effects of the catecholamines, adrenergic blocking agents, prostaglandin E_1, and insulin on cyclic AMP levels in the rat epididymal fat pad in vitro. Annals of N. Y. Acad. Sci., 139:849 (1967).

12. Robison, G.A., Butcher, R.W., and Sutherland, E.W., Adenyl cyclase as an adrenergic receptor. Annals of N. Y. Acad. Sci., 139:703 (1967).

13. Butcher, R.W., Pike, J.E., and Sutherland, E.W., The effect of prostaglandin E_1 on adenosine 3',5'-monophosphate levels in adipose tissue. In: II Nobel Symposium, Prostaglandins, S. Bergström and B. Samuelsson, Editors, Almqvist and Wiksell, Stockholm, pg. 133 (1967).

14. DeRobertis, E., De Lores Arnaiz, G.R., Alberici, M., Butcher, R.W., and Sutherland, E.W., Subcellular distribution of adenyl cyclase and cyclic phosphodiesterase in rat brain cortex. J. Biol. Chem., 242:3487 (1967).

15. Grahame-Smith, D.G., Butcher, R.W., Ney, R.L., and Sutherland, E.W., Adenosine 3',5'-monophosphate as the intracellular mediator of the action of ACTH on the adrenal cortex. J. Biol. Chem., 242:5535 (1967).

16. Butcher, R.W., Baird, C.E., and Sutherland, E.W., Effects of prostaglandins on cyclic AMP levels in fat and other tissues. In: Prostaglandin Symposium of the Worcester Foundation for Experimental Biology, P. Ramwell and J. Shaw, Editors, Interscience Publishers, N.Y. pg. 93 (1967).

17. Jefferson, L.S., Exton, J.H., Butcher, R.W., Sutherland, E.W., and Park, C.R., Role of adenosine 3',5'-monophosphate in the effects of insulin and anti-insulin serum on liver metabolism. J. Biol. Chem., 243:1031 (1968).

18. Sutherland, E.W., Robison, G.A., and Butcher, R.W., Some aspects of the biological role of adenosine 3',5'-monophosphate (cyclic AMP). Circulation, XXXVII:279 (1968).

19. Butcher, R.W., Baird, C.E., and Sutherland, E.W., Effects of lipolytic and anti-lipolytic substances on adenosine 3',5'-monophosphate levels in isolated fat cells. J. Biol. Chem., 243:1705 (1968).

Research Papers - Dr. Butcher

20. Butcher, R.W., and Baird, C.E., Effects of prostaglandins on cyclic AMP levels in fat and other tissues. J. Biol. Chem., 243:1713 (1968).

21. Butcher, R.W., Robison, G.A., Hardman, J.G., and Sutherland, E.W., The role of cyclic AMP in hormone actions. In: Advances in Enzyme Regulation, G. Weber, Editor, 6:357 (1968).

22. Abe, K., Butcher, R.W., Nicholson, W.E., Baird, C.E., Liddle, R.A., and Liddle, G.W., Adenosine 3',5'-monophosphate (cyclic AMP) as the mediator of the actions of melanocyte stimulating hormone (MHS) and norepinephrine on the frog skin. Endocrin., 84:362 (1969).

23. Butcher, R.W., and Baird, C.E., The regulation of cyclic AMP and lipolysis in adipose tissue by hormones and other agents. In: Proceedings of 3rd International Symposium on Drugs Affecting Lipid Metabolism, Milan, pg. 5 (1969).

24. Fleischer, N., Donald, R.A., and Butcher, R.W., Evidence for the involvement of adenosine 3',5'-monophosphate in the release of ACTH from the rat pituitary in vitro. Am. J. Physiol., 217:1287 (1969).

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Updated Bibliography - Francis J. Chlapowski, Ph. D.

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UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL

MEMORANDUM

From Sam L. Clark, Jr., M. D. Date April 28, 1971

To Muriel Sawyer

Subject Your memo of April 7 (updated bibliography, activities, research grants).

Addition to bibliography:

Clark, Sam L., Jr. 1971. The effects of cortisol and BUDR on cellular differentiation in the small intestine in suckling rats. (manuscript in preparation).

Fredric S. Fay, Ph.D.

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1. Reeves, Robert B. and Fredric S. Fay. Cyanocobalamin (vitamin B_{12}) uptake by Ochromonas malhamensis. Am. J. Physiol. 210 (60: 1273-1278 (1966).

2. Fay, Fredric S. Oxygen Consumption of the Carotid Body. Am. J. Physiol. 218:518-523 (1970).

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4. Fay, Fredric S. Studies on the Guinea Pig Ductus Arteriosus. I. The Cellular and Metabolic Basis for Oxygen Sensitivity. Am. J. Physiol., in press.

5. Fay, Fredric S. Studies on the Guinea Pig Ductus Arteriosus. II. Irreversibility of Closure after Birth. Am. J. Physiol., submitted for publication.

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7. Fay, Fredric S. and Frans F. Jöbsis. Studies on the Guinea Pig Ductus Arteriosus. III. Optical changes associated with the contractile response to oxygen. In preparation.

8. Cooke, P. H. and Fredric S. Fay. The correlation between fiber-length, ultrastructure, and the length-tension relationship of mammalian smooth muscle. J. Cell Biol., submitted for publication.

Fredric S. Fay, Ph.D.

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April 20, 1971

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National Science Foundation #GB-24167 "Pathogenesis of Osteopetrosis in Rats"

LAMAR SOUTTER, M.D.

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DEPARTMENT OF THE AIR FORCE
DETACHMENT 370, AIR FORCE ROTC (AU)
UNIVERSITY OF MASSACHUSETTS, AMHERST, MASSACHUSETTS 01002

ANNUAL REPORT OF THE DEPARTMENT OF AIR SCIENCE

1. APPROPRIATIONS - by fiscal year (FY)

		FY 69	FY 70	FY 71
01	Salaries, Permanent Positions	$11,905.00	$7,670.00	$7,932.25
03	Services, Non-Employees	200.00	200.00	200.00
04	Food	30.00	50.00	30.00
10	Travel & Automotive Expense	100.00	100.00	100.00
12	Repairs & Alterations	100.00	100.00	100.00
13	Special Supplies & Expenses	450.00	450.00	500.00
14	Office & Administrative Expenses	150.00	35.00	-
14-1	Telephone	700.00	815.00	782.00
		$13,635.00	$9,420.00	$9,644.25

2. PERSONNEL - as of September

	1968	1969	1970
Colonel	1	1	1
Major	1	0	1
Captain	2	2	2
TSgt	2	2	2
SSgt	2	1	1
Principal Clerk (Grade 9)	1	1	1
Military Property Clerk (Grade 5)	1	0	0
TOTALS	10	7	8

3. ORGANIZATIONAL CHART - See Attachment #1.

4. STUDENTS OR CLIENTELE

a. Number of Majors -- None.

b. Number of students taught -- September

	1968	1969	1970
Air Science 1	152	110	54
Air Science 2	50	42	22
Air Science 3	29	32	20
Air Science 4	39	34	29
TOTALS	270	218	125

5. FACULTY PUBLICATIONS, RESEARCH GRANTS, RESEARCH PROJECTS, AND OTHER PROFESSIONAL ACTIVITIES

a. Hayes, Robert E., Major, "Be a Leader Later" -- A Simulation of Blake's Leadership Grid, AFROTC Education Bulletin: AFROTCRP 50-1, Vol 13, Number 6, February 1971, Maxwell Air Force Base, Alabama, pp 11-18.

b. Duto, Michael D., and Robinson, Hugh T., "The Problem--Retention. An Analysis of AFROTC at the University of Massachusetts." AFROTC Education Bulletin: AFROTCRP 50-1, Vol 13, Number 7, March 1971, Maxwell Air Force Base, Alabama, pp 5-8.

6. MAJOR ACCOMPLISHMENTS

a. The Department of Air Science commissioned 23 students during FY 1971.

b. The College Scholarship Program, formerly the Financial Assistance Grant Program authorized by "The ROTC Vitalization Act of 1964," which provides tuition, fees, and books for those students selected for the program, has been successful. Following is the number of scholarships this department has received since Academic Year 1966/67:

Year	Number
Academic Year 66/67	7
Academic Year 67/68	9
Academic Year 68/69	21
Academic Year 69/70	15
Academic Year 70/71	17

c. Flight Instruction Program. Eight students successfully completed the Flight Instruction Program during Fiscal Year 1971.

d. During 1971 the Department has forwarded ten course proposals through channels for review by the Faculty Senate. The course revisions involve increased participation by University faculty, as well as updated reference materials.

7. SPECIAL PROJECTS OR PROGRAMS:

The University of Massachusetts Allan B. Bunce Squadron of the Arnold Air Society (AAS), a cadet honor society, received considerable recognition during the year. In addition to several service projects conducted during 1970-1971 (including over $1100 collected for the Pakistani Relief Fund) the Area Staff held a Conclave in Northampton for eight Cadet Squadrons in the Northeast.

The University Angel Flight, affiliated with the Allan B. Bunce Squadron, was active during the year assisting the Arnold Air Society in the Pakistani Relief Fund drive and other service projects. Over $200 was sent to a South Vietnamese Orphanage to buy powdered milk for the children there.

8. FUTURE PLANS AND NEEDS:

The Department will continue to develop its curriculum and teacher qualifications to insure the maintenance of an educational program that meets the requirements of students, the University, and the United States Air Force. The basic problem confronting this Department is a lack of fully-qualified students interested in the program because of a general anti-war, anti-administration syndrome, a malaise which may require a lengthy period to cure.

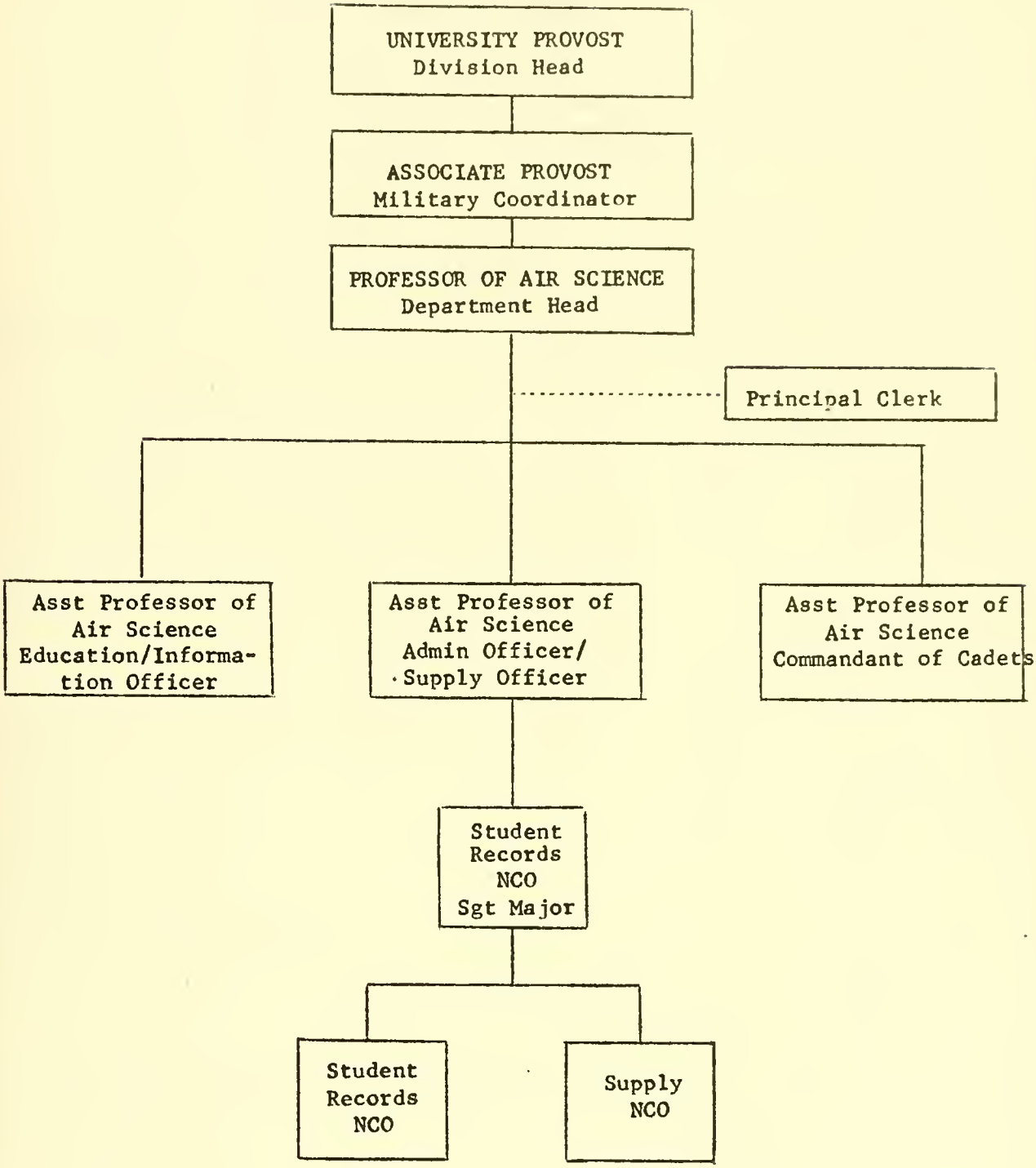
Robert E. Hayes

ROBERT E. HAYES, Lt Colonel, USAF
Acting Professor of Air Science

1 Atch
Organizational Chart

ORGANIZATIONAL CHART

DEPARTMENT OF AIR SCIENCE



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DEPARTMENT OF MILITARY SCIENCE
UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS 01002

30 June 1971

ANNUAL REPORT OF THE DEPARTMENT OF MILITARY SCIENCE

1. APPROPRIATIONS - by fiscal year (FY):

		FY 1968-69	FY 1969-70	FY 1970-71
03	Service, Non-employee	$ 200.00	$ 200.00	$ 200.00
04	Food for persons	40.00	50.00	40.00
06	Dry Cleaning	- -	- -	- -
10	Travel & Automobile Expenses	75.00	75.00	75.00
12	Maintenance & Repairs	100.00	100.00	100.00
13	Special Supplies & Expenses	300.00	300.00	300.00
14	Office & Administrative Expenses	150.00	150.00	150.00
14-1	Telephone	1000.00	1000.00	1000.00
15	Equipment	- -	- -	- -
	TOTALS	$ 1865.00	$ 1875.00	$ 1865.00

2. PERSONNEL - As of September of:

	1968	1969	1970
Colonel	1	1	1
Lieutenant Colonel	0	0	0
Major	0	1	2
Captain	3	2	2
Enlisted	5	5	5
Senior Clerk, Grade 6	0	1	1
Principal Clerk, Grade 9	1	1	1
Armorer Artificer, Grade	1	1	1
	11	12	13

3. ORGANIZATIONAL CHART - See Inclosure 1.

DEPARTMENT OF MILITARY SCIENCE
UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS 01003

30 June 1971

ANNUAL REPORT OF THE DEPARTMENT OF MILITARY SCIENCE

1. APPROPRIATIONS - by fiscal year (FY):

		FY 1969-70	FY 1970-71	FY 1971-72
03	Service, Non-employee	$ 200.00	$ 270.00	$ 270.00
04	Food for persons	40.00	50.00	40.00
05	Dry Cleaning	- -	- -	- -
10	Travel & Automobile Expenses	75.00	75.00	75.00
12	Maintenance & Repairs	120.00	170.00	170.00
13	Special Supplies & Expenses	300.00	300.00	300.00
14	Office & Administrative Expenses	150.00	150.00	150.00
14-1	Telephone	1000.00	1000.00	1000.00
15	Equipment	- -	- -	- -
	TOTALS	$ 1885.00	$ 1815.00	$ 1865.00

2. PERSONNEL - As of September of:

	1968	1969	1970
Colonel	1	1	1
Lieutenant Colonel	0	0	0
Major	0	1	2
Captain	3	2	2
Enlisted	5	5	5
Senior Clerk, Grade 6	1	1	1
Technical Clerk, Grade 5	1	1	1
Armorer Artificer, Grade	1	1	1
	11	12	13

3. ACADEMIC/ACADEMIC CREDIT - See Enclosure 1.

4. STUDENTS OR CLIENTELE SERVED

a. Majors

	MS I	MS II	MS III	MS IV
Accounting				1
Agric & Food Econ				1
Anthropology	2			
Bio-chemistry	1			
Botany	1			
Business Administration	5	2		
Dramatics		2		
Environmental Design			1	
Education			1	
Engineering:				
Civil	4	1		1
Chemical	1			1
Electrical	3	2		1
Industrial				2
Mechanical	2	3		
English	1	1		
French		1		
Forestry	3			
Geology				1
Government	1	2	1	
History	1	5	2	1
Hotel & Rest Mgt	2			1
Journalistic Studies	1		1	
Landscape Architecture	1			
Management			2	1
Marketing				1
Mathematics	3	6		
Men's PE		1		2
Philosophy	1			
Plant & Soil Science		1	2	
Psychology		2	1	2
Public Health	1	1		
Sociology	1			1
Veterinary & Animal Science	4			1
Wildlife Management	1	1	2	2
Zoology	1			
GRADUATE SCHOOL			3	1

b. Number of Students Taught as of September of:

	1968	1969	1970
1 Freshmen	158	56	40
2 Sophomores	68	26	31
3 Juniors	57	22	22
4 Seniors	50	45	21
TOTALS	333	149	114

4. STUDENTS ON UNIVERSITY SERVICE

a. Majors

	Mo. I	Mo. II	Mo. III	Mo. IV
Accounting				1
Agric & Food Econ				1
Anthropology	2			
Bio-chemistry	1			
Botany	1			
Business Administration	3	2		
Dramatics		1		
Environmental Design			1	
Education			1	
Engineering:				
Civil	4	1		1
Chemical	1			1
Electrical	3	2		1
Industrial				2
Mechanical	2	3		
English	1	1		
French		1		
Forestry	3			
Geology				1
Government	1	2	1	
History	1	5	2	1
Hotel & Rest Mgt	2			1
Journalistic Studies	1		1	
Landscape Architecture	1			
Management			2	1
Marketing				1
Mathematics	3	6		
Men's PE		1		2
Philosophy	1			
Plant & Soil Science			1	
Psychology		2	1	2
Public Health	1	1		
Sociology	1			1
Veterinary & Animal Science	4			1
Wildlife Management	1	1	2	2
Zoology	1			
GRADUATE SCHOOL			2	1

b. Number of Students Taught as of September of:

	1958	1959	1960
1 Freshmen	172	56	40
2 Sophomores	68	26	21
3 Juniors	31	22	22
4 Seniors	55	42	21
TOTALS	326	146	104

5. FACULTY PUBLICATIONS, RESEARCH GRANTS, PROJECTS & PROFESSIONAL ACTIVITIES:

a. The principle project of the department this year was to conduct a basic study and re-evaluation of the Military Science curriculum to improve its academic excellence pursuant to the Board of Trustees' motion of June 29, 1970. Such study and re-evaluation has been concluded and several course proposals are now in process of preparation for submission to the Military Affairs Sub-Committee.

b. Additionally, as in the past, the department has attended professional conferences and has continued its active lecture tour in the Western Massachusetts area.

c. The fall semester SY 70-71 marked the introduction of a new honors colloquium entitled, "The Military Role in Today's Society," conducted at the request of non-ROTC students residing in Grayson House. The course was presented by the Department of Military Science under the sponsorship of the Orchard Hill Complex. The conduct of instruction was in seminar fashion with weekly meetings during the evening at Grayson House. Students completing the course were granted one (1) credit toward graduation by the Honors Department.

d. The Department is also represented in the 1970-71 University of Massachusetts Chapter of Mortar Board's Directory of Speakers. The purpose of the Directory is to provide interested groups with faculty speakers in an effort to bring together the interests of the members of the University faculty and others with similar interests.

e. Resulting from criticism from some quarters that close-order drill was a non-productive exercise, an experiment was conducted in developing a more comprehensive idea of a Leadership Laboratory in which drill was de-emphasized and classroom discussions and presentations on various aspects of leadership and military life were substituted. This experiment was based on the idea that the techniques of close-order drill would be learned very quickly by college men, that the drill is unpopular in the minds of the students.

f. After extensive experimentation, testing and questionnaires, it was determined that the optimum Leadership Laboratory should place more emphasis on close-order drill than in the past year, less emphasis on theoretical leadership instruction and more practical work in the field and in tactics. Many students expressed disappointment at the lack of field work and purely military-oriented subject matter. The Sophomores, who now have had two years of minimal close-order drill, feel that they will be at a disadvantage when commissioned unless they get more practical application in close-order drill and voicing commands. Results also showed that students do not learn the basic close-order drill as quickly as originally anticipated. The drill sequence has been changed to allow the cadets to advance as quickly as they possibly can from plateau to plateau through the use of individual and group competitions. As a result the present plan is to introduce all cadets to drill, early in the year, increasing the concentrations over the past two years in the early weeks of the fall semester, thereby taking advantage of the favorable weather. Consideration is also being given to a voluntary field exercise for Freshmen and Sophomores. The overall plan, which will include modification of the experiments of the last two years, will be progressive and competitive and will hopefully approach the goals of the Laboratory and the expectations of the students.

3. MILITARY EDUCATION, ROTC, RESERVE UNITS, ROTC & PROFESSIONAL ACTIVITIES

a. The principle project of the department this year was to complete a basic study and re-evaluation of the Military Science curriculum to improve its credible relevance pursuant to the Board of Trustees' motion of June 24, 1970. Such study and re-evaluation has been concluded and several course proposals are now in process of preparation for submission to the Military Affairs Sub-Committee.

b. Additionally, as in the past, the department has attended professional conferences and has continued its active lecture tour in the Western Massachusetts area.

c. The fall semester 1970-71 marked the introduction of a new honors colloquium entitled, "The Military Role in Today's Society," conducted in the amount of weekly students meeting in Grayson House. The course was presented by the Department of Military Science under the sponsorship of the Outline Hall Program. The conduct of instruction was in seminar fashion with weekly meetings during the evening at Grayson House. Students completing the course were granted one (1) credit toward graduation by the Honors Department.

d. The Department is also represented in the 1970-71 University of Massachusetts Chancellor Advisory Board's Directory of Specialists. The purpose of the Directory is to provide interested groups with faculty spokesmen in an effort to further coordinate the interests of the members of the University faculty and address other similar interests.

e. Resulting from criticism from some quarters that close-order drill was a meaningless exercise, an experiment was conducted in developing a more acceptable idea of a leadership laboratory in which drill was accomplished and classroom discussions and presentations on various aspects of leadership and military life were substituted. This experiment was based on the idea that the techniques of close-order drill would be learned very quickly by college men, that the drill is unpopular in the minds of the students.

f. After extensive experimentation, testing and questionnaires, it was determined that the optimum leadership laboratory should place more emphasis on close-order drill than in the past year, less emphasis on theoretical leadership instruction and more practical work in the field and in tactics. Many students expressed disappointment at the lack of field work and purely military-oriented subject matter. The Sophomores, who now have had two years of minimal close-order drill, feel that they will be at a disadvantage when commissioned unless they get more practical application in close-order drill and voicing commands. Results also indicate that students do not learn the basic close-order drill as quickly as originally anticipated. The drill sequence has been changed to allow the cadets to advance at a quicker pace as they possibly can from platoon to platoon through the use of individual and group competitions. As a result the present plan is to introduce drill cadets to drill, early in the year, increasing the competitions over the period of two years in the early weeks of the fall semester, thereby taking advantage of the favorable weather. Consideration is also being given to a voluntary field exercise for Freshmen and Sophomores. The overall plan, which will include modification of the experiments of the last two years, will be preparatory and competitive and will hopefully approach the goals of the laboratory and the expectations of the students.

g. During the year the academic qualifications of the military faculty were improved. Four of the five officers assigned possessed Masters' Degrees (one-MBA, two Masters' in Education and one in Organic Chemistry). A fifth officer, a University alumnus with a Masters' in Civil Engineering will join the Department in July 1971.

6. SPECIAL PROJECTS OR PROGRAMS.

a. The Army ROTC Cadet Brigade remains under the command of the Cadet Staff and supervision of the Military Faculty. They participated in a weekly Leadership Laboratory, and conducted six (6) field exercises to include a weekend orientation trip to Fort Belvoir, Virginia.

b. The Bay State Special Forces, a recognized student organization, continued with its activities this year. Originally an outgrowth of the Bay State Rifles founded in 1952, it is a voluntary organization composed of regular members of the Department of Military Science Cadet Brigade. The BSSF offers rugged, diversified training to the cadet to better prepare him for duty in the active army with emphasis on Special Forces training. Additionally, participation in the BSSF program is designed to improve the cadets' physical fitness and has a secondary mission of furnishing honor guards and marching units for university and selected civic functions.

c. The Precisionettes, the University All-Woman Drill Team, completed their sixth year with the assistance of the Department of Military Science. Formerly, a part of the University Band, the Precisonettes performed as an independent unit taking part in many various activities during the school year. Included in these were half-time performances at football games, local parades, car washes and a car rally. After placing second in National Cherry Blossom Festival in Washington, DC for three successive years, the team saw its budget eliminated by the Student Senate. This leaves the future of the Precisionettes in doubt as its main recruiting draw, National Competition, has been eliminated due to financial limitations.

d. The Scabbard and Blade Honor Society was formed as "L" Company, 15th Regiment during the SY 1964-65. Since its inception it has been active in the social affairs of the detachment, particularly as members of the Military Ball Committee. In addition, the organization has been concerned with the continuance of the ROTC image on campus. Activities this year have ranged from selling programs at home football games, to participation on the Pakistan Relief Drive and conducting a Christmas Party at the Belchertown State School. Many changes in the organization are under consideration to include withdrawal from the National society of Scabbard and Blade to allow formation of a similar local organization permitting basic course cadets in its membership.

e. On June 22, 1970, the University notified Department of the Army of the intention to terminate the current ROTC contract for purposes of renegotiating certain portions of this contract. Representatives of the University and Department of the Army met on 27 August 1970 for negotiations. At that time all aspects were mutually agreed upon except the question of full federal funding of the program. Due to the necessity for congressional action it has not been possible to render a satisfactory agreement in this area. Accordingly, the contract is in abeyance. At the request of the Chancellor, Department of the Army has consented to allow the Military Science Program to be conducted without the use of weapons on campus.

[illegible] During the year the academic qualifications of the military faculty were improved. Four of the five civilians assigned possessed Masters' degrees (one PhD, two Masters', [illegible] and one in Operations Research). A fifth civilian [illegible] Military academy graduate Masters' in Civil Engineering will join the Department in July 1971.

e. SPECIAL PROJECTS AND PROGRAMS.

a. The Army ROTC Cadet Brigade continues under the command of the Cadet Staff and supervision of the Military Faculty. They participated in a worthy leadership laboratory and conducted (1) [illegible] activities to include a weekend orientation trip to Fort Bragg, Virginia.

b. The Air Force Special Forces, a concept of student organization, continued with its activities this year. Originally [illegible] of the Air Force Cadets founded in 1964, it is a voluntary organization comprised of regular members of the Department of Aerospace Studies Cadet Brigade. The ROTC officers support the training by the cadets in order to prepare them for duty in the active Air Force physically and [illegible] for some training. Additionally, participation in the ROTC program is [illegible] to the cadets' physical fitness and is a supplemental measure of assessing their qualities and motivation for university and selected active duty.

c. The Presidential Cup, the University intramural Tennis, [illegible] championship with the assistance of the Department of Military Science. Formerly, [illegible] of the University Team, the intramural program performed as an independent unit [illegible] to many various activities during the school year. Included in these were [illegible] performances at football games, local parades, car washes and a car [illegible], other placing second in National Cherry Blossom Festival in Washington. DC for three successive years, the team [illegible] its budget allotment by the student [illegible]. This issued the funds of the Procurement to [illegible] to [illegible] the [illegible] and [illegible] Intramural Committee, has been financed due to financial "[illegible]".

d. The Pershing and Blade Honor Society was formed as "[illegible]" Company, 1st Regiment during the SY 1969-70. Since its inception it has been active in the social affairs of the academy, [illegible] as members of the Military Ball committee. In addition, the organization has been [illegible] with the continuance of the ROTC Image in campus. Activities this year have ranged from [illegible] [illegible] to home Football games, participation in the Parents Fall Fund and [illegible] a Brigadier Party at the Delaware State Fair. Many efforts in the [illegible] are made concerning to insure without [illegible] the [illegible] of Scabbard and Blade to allow formation of a similar local organization [illegible] ROTC cadets in the membership.

e. On June 24, 1970, the University discontinued Department of the Army [illegible] to terminate the current PMS contract for purposes of [illegible] contract performance of this contract. Representatives of the University and Department of the Army met on 27 August 1970 for negotiations. At that time all aspects [illegible] were [illegible] the termination of the Federal Funding of the program. Due to the necessity for reorganization action it has not been possible to [illegible] a disciplinary agreement to [illegible], accordingly, the contract is [illegible]. The program of the Department of the Army has [illegible] to allow the military science program to be continued without the use of resident [illegible].

f. Major Accomplishments During the Year:

(1) In the interest of enriching and improving the excellence of the Military Science Program, the Department has undertaken sponsorship of a distinguished guest speaker program.

(2) With the assistance of the National Strategic Information Center of the New York University, it is possible to invite distinguished academicians from various universities and research institutions to speak to the Cadet Corps and other members of the University Community on subjects which have a bearing on the military, diplomatic and strategic problems of the United States.

(3) The program known as the National Strategic Information Center ROTC Enrichment Program was established in September 1968 to provide highly qualified speakers to supplement the existing Military Science curriculum. NSIC is a private organization and the program is conducted at no expense to the government. This year's speakers were:

Professor Gerhart Niemeyer
Department of Government & International Affairs
University of Notre Dame

Professor Joseph I. Coffey
Department of Public & International Affairs
University of Pittsburgh

(4) Experience during this program indicates a necessity for a more elaborate and widely publicized program for SY 1971-1972.

(5) An indication of the interest in the academic aspects of the curriculum is the increase in non-cadet students and in the cross-enrollment of students from the Five College Complex. There were in the fall semester three female students enrolled and in the spring semester two male students from Amherst College, one from Smith College, one female student from Mount Holyoke College and two male students from the University of Massachusetts.

g. On 18 November 1970, in response to the 13th-15th of November cyclones and tidal wave disasters that struck East Pakistan, decisions were made that led to a joint Army-Air Force ROTC Pakistan Relief Drive. In an effort to aid a country whose dead were estimated at upwards of half a million and whose entire rice crop was destroyed, the fund raising drive took shape. That afternoon a picture was taken showing Chancellor Tippo presenting the first check for the fund. In an effort to gain publicity for the drive, the University News Bureau distributed the photo and a mailing address for the checks to every newspaper in the state. Collections were taken at the 21 November home football game. Publicity continued through the use of several local cooperating radio stations who publicized the drive. Collection efforts continued with a table set up in the Campus Center and concluded with a door-to-door canvass of dormitories. When the drive was completed, Chancellor Tippo was presented with a check for $1,165.75 which was forwarded to Senator Kennedy for presentation on behalf of our students to the Pakistani disaster survivors.

C. Major Accomplishments During the Year:

(1) In the interest of enriching and improving the excellence of the Military Science Program, the Department has undertaken sponsorship of a distinguished guest speaker program.

(2) With the assistance of the National Strategic Information Center of the New York University, it is possible to invite distinguished academicians from various universities and research institutions to speak to the Cadet Corps and other members of the University Community on occasions when have a bearing on the military, diplomatic and strategic problems of the United States.

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Professor Graham Allenoyer
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6. On 18 November 1970, in response to the 12th-13th of November cyclones and tidal wave disasters that struck East Pakistan, declaiture were made that led to a joint Army-Air Force ROTC Pakistan Relief Drive. In an effort to aid a country whose dead were estimated at upwards of half a million and whose entire rice crop was destroyed, the fund raising drive took shape. That afternoon a picture was taken showing Chancellor Tipps presenting the first check for the fund. In an effort to gain publicity for the drive, the University News Bureau distributed the photo and a mailing address for the checks to every newspaper in the state. Collections were taken at the 21 November home football game. Publicity concerning the drive through the use of several local cooperating radio stations was published the drive. Collection efforts continued with a table set up in the Campus Center and continued with a door-to-door canvass of dormitories. When the drive was completed, Chancellor Tipps was presented with a check for $1,183.75 which was forwarded to Pakistan Immediately for presentation on behalf of our students to the Pakistani disaster survivors.

7. FUTURE PLANS AND NEEDS

The Department of Military Science is continuing its work to develop a more flexible curriculum to meet more specifically the requirements of the University and the requirements of a thoroughly educated officer. The office of the Provost has established a policy whereby faculty members assisting the Military Science curriculum will receive recognition by their respective departments. New course proposals will be developed for the entire four-year program. Some means must be found to instruct the junior class in the use of firearms in order for them to be able to compete on an equitable basis with their contemporaries at summer camp.

1 Incl
Organizational Chart

GEORGE I. CONNOLLY, JR.
Colonel, FA
Professor of Military Science

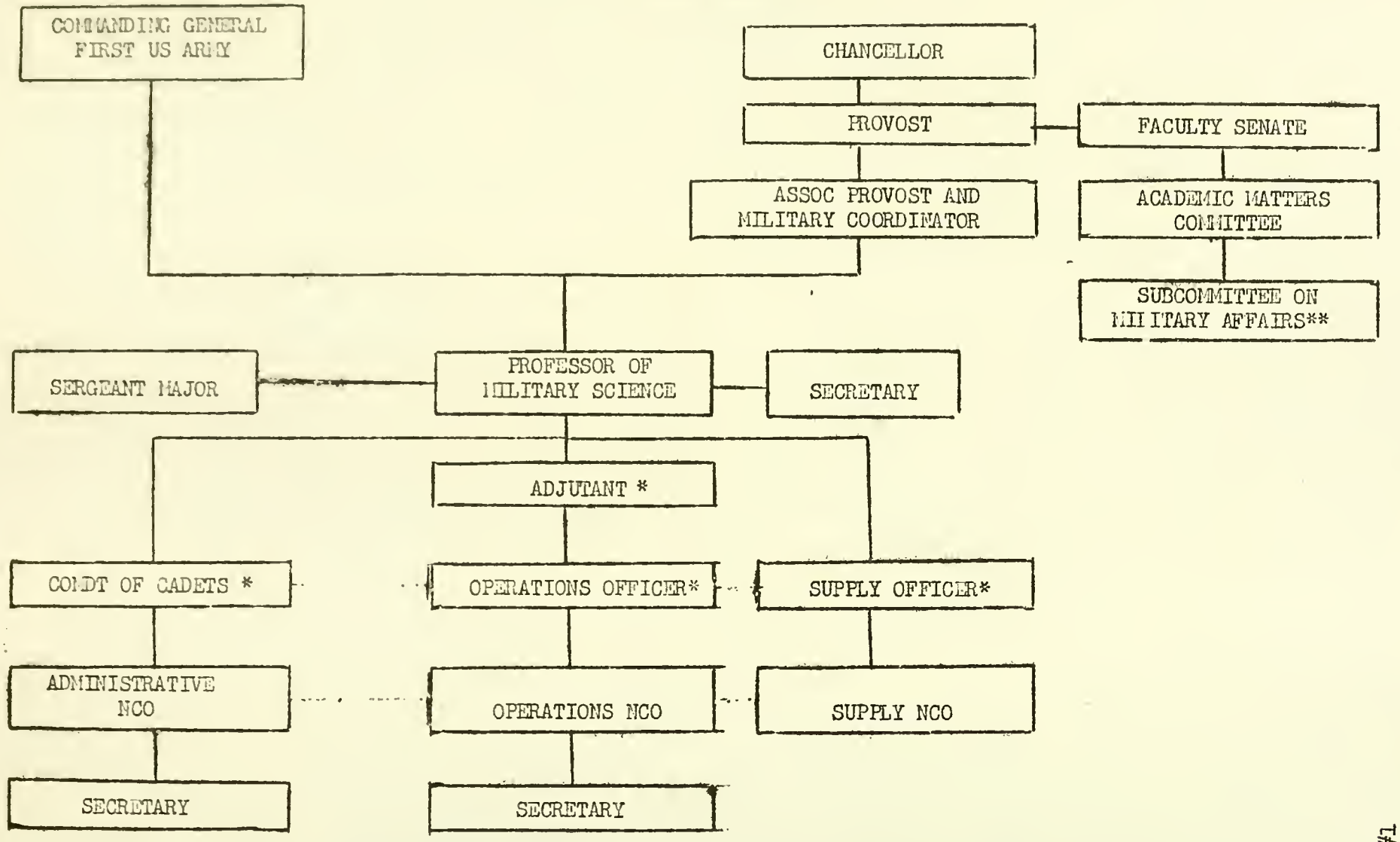
7. FUTURE PLANS AND NEEDS

The Department of Military Science is conducting its work to develop a more flexible course that is to meet more specifically the requirements of the University and the requirements of a thoroughly educated officer. The office of the Provost has established a policy whereby faculty members assisting the Military Science curriculum will receive recognition by their respective departments. New courses proposals will be developed for the entire four-year program. Some means must be found to interest the junior class in the use of firearms in order for them to be able to compete on an equitable basis with their contemporaries at summer camp.

1 Incl
Organizational Chart

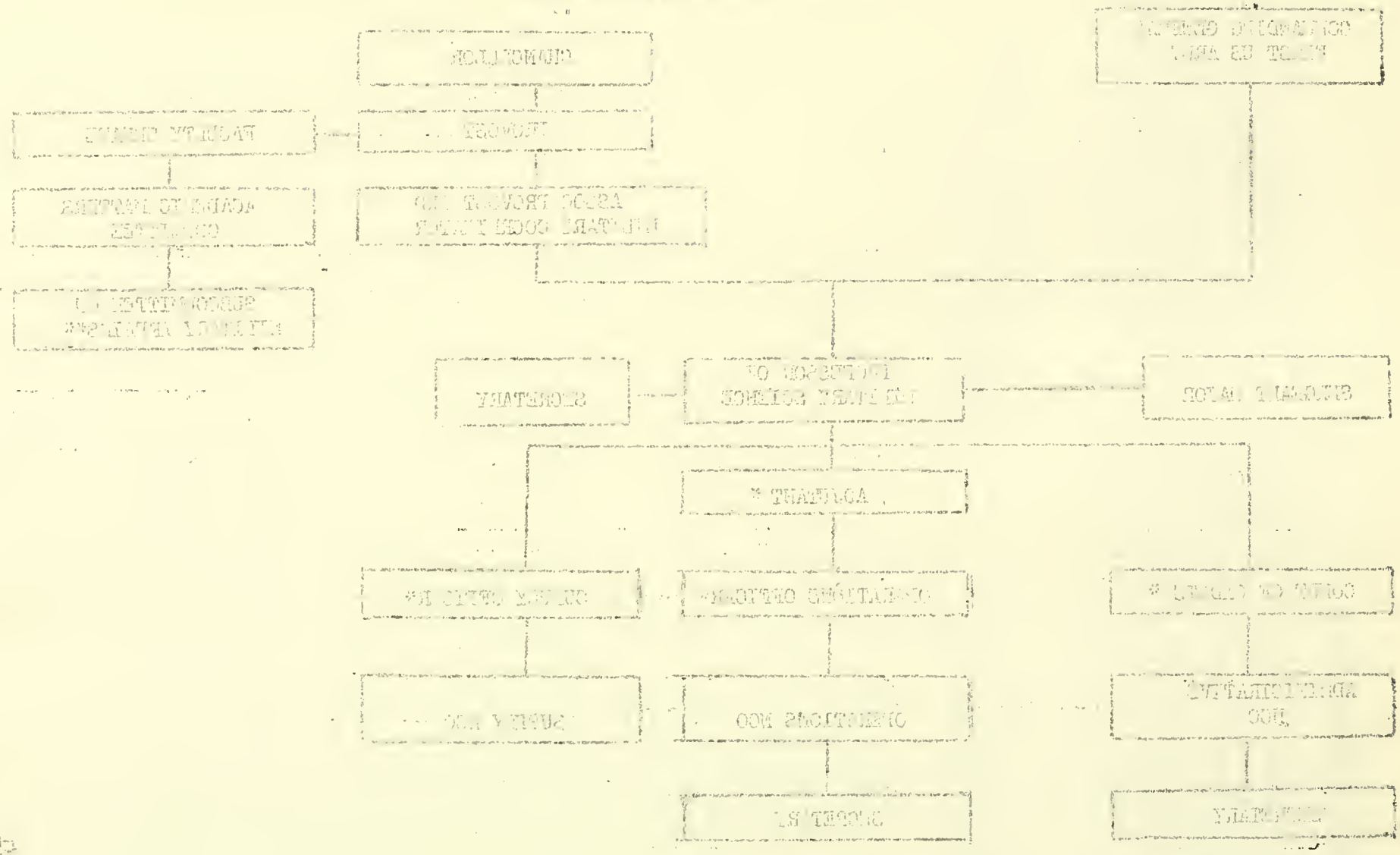
GEORGE I. GEMMILL, JR.
Colonel, FA
Professor of Military Science

DEPARTMENT OF MILITARY SCIENCE
UNIVERSITY OF MASSACHUSETTS, AMHERST, MA 01002
ORGANIZATIONAL CHART



* Full time instructors, and Military Science class advisors.
** On all academic and curriculum matters and qualifications of officers nominated for assignment to department.

Incl #1



* Full time superiors, and military science plan advisers.
** On all economic and curriculum matters and qualifications of officers nominated for teaching and to departments.

UNIVERSITY OF MASSACHUSETTS

SCHOOL OF NURSING

A N N U A L R E P O R T

July 1, 1970 - June 30, 1971

* * * * * * * * * * *

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UNIVERSITY OF MASSACHUSETTS
School of Nursing

ANNUAL REPORT

July 1, 1970 - June 30, 1971

I. ALLOTMENT TO SCHOOL (State):

Fiscal Year	Allotment (exclusive of salaries)
1968-69	$33,400.00
1969-70	$34,400.00
1970-71	$30,350.00

II. PERSONNEL:

Professional - (Full-time)

Academic Rank	Number Sept. 1968	Sept. 1969	Sept. 1970
Dean & Professor	1	1	[1]
Associate Dean & Professor	0	1	1
Professor	2	2	3
Associate Professor	3	3	6**
Assistant Professor	15*	14***	14***
Instructor	11.5	11.5	13
Total	32.5	32.5	38

* Two (2) salaries paid from Mental Health Grant.
** One (1) salary paid from Improvement in Nurse Training Grant.
*** One (1) salary paid from Mental Health Grant.
[1] Retired October, 1970.

Professional - (Part-time)

Clinical Instructor	1	2	1
Clinical Dietitian	1	0	0
Lecturer (Research)	1	1	1

Staffing Pattern:

Academic Rank	% University Standards	School of Nursing No.	School of Nursing %	Comparison of School with U.M. Standard %
Professor*	25	5	13	-12
Associate Professor	20	6	16	- 4
Assistant Professor	30	14	37	+ 7
Instructor	25	13	34	+ 9
Total	100	38	100	

*Inclusive of Dean and Associate Dean.

Degree and Rank:

Doctoral	Number (f.t.)	(p.t.)	Academic Rank
Ph.D.	1		Professor
Ed.D.	1		Professor & Acting Dean
D.N.Sc.	1		Associate Professor
Master's			
	1		Dean & Professor (retired Oct., '
	2		Professor
	6		Associate Professor
	14		Assistant Professor
	12		Instructor
Bachelor's			
	2		Clinical Instructor

Personnel Action - Faculty:

Appointments - N = New; R = Replacement; FT = Full-time; PT = Part-time

Date	Name	Rank	Functional Area	N		R	
				FT	PT	FT	PT
9/70	Hope Belitsos	Instructor	Medical-Surgical Nurs.			X	
9/70	Christina Quinn	Assistant Professor	Nursing Fundamentals	X			
9/70	Marjorie Nestor	Instructor	Maternal & Infant		X		
9/70	Elizabeth Clarke	Assistant Professor	Administration of Nursing Care			X	
9/70	Aloo Driver	Lecturer	Research				X
9/70	Elizabeth Reader	Instructor	Nursing Fundamentals			X	
9/70	Elaine Barkin*	Lecturer	Social Service		X		
9/70	Charlene Cotting	Instructor	Community Nursing			X	
9/70	Jeanne Lehman	Instructor	Medical-Surgical Nurs.			X	
9/70	Joyce Wilkes	Instructor	Medical-Surgical Nurs.				X
1/71	Margaret Craig*	Instructor	Psychiatric-Mental Health Nursing			X	

* Paid from Mental Health Grant.

Promotions:

Date	Name	Promoted		Area
		From	To	
2/1/71	Elizabeth Clarke	Assistant Professor	Associate Professor	Medical-Surgical

Tenure:

Date	Name	Rank	Clinical Area
2/1/71	Constance Petrunenko	Associate Professor	Community Nursing

Personnel Action - Faculty:

Appointments - N = New; R = Replacement; FT = Full-time; PT = Part-time

Date	Name	Rank	Functional Area	N		R	
				FT	PT	FT	PT
9/70	Hope Belitsos	Instructor	Medical-Surgical Nurs.			X	
9/70	Christina Quinn	Assistant Professor	Nursing Fundamentals	X			
9/70	Marjorie Nestor	Instructor	Maternal & Infant		X		
9/70	Elizabeth Clarke	Assistant Professor	Administration of Nursing Care			X	
9/70	Aloo Driver	Lecturer	Research				X
9/70	Elizabeth Reader	Instructor	Nursing Fundamentals			X	
9/70	Elaine Barkin*	Lecturer	Social Service		X		
9/70	Charlene Cotting	Instructor	Community Nursing			X	
9/70	Jeanne Lehman	Instructor	Medical-Surgical Nurs.			X	
9/70	Joyce Wilkes	Instructor	Medical-Surgical Nurs.				X
1/71	Margaret Craig*	Instructor	Psychiatric-Mental Health Nursing			X	

* Paid from Mental Health Grant.

Promotions:

Date	Name	Promoted		Area
		From	To	
2/1/71	Elizabeth Clarke	Assistant Professor	Associate Professor	Medical-Surgical

Tenure:

Date	Name	Rank	Clinical Area
2/1/71	Constance Petrunenko	Associate Professor	Community Nursing

Resignations:

Date	Name	Rank	Yrs. of Service	Reason
10/70	Mary A. Maher	Professor & Dean	17	To retire.
1/71	Janet Simmons	Assistant Professor	4½	To work closer to home.
1/71	Hope Belitsos	Instructor	½	To have a baby.
8/71	Faye Moore	Instructor	3	To work closer to home.
8/71	Karleen Bjorklund	Clinical Instructor	2	To have a baby.
8/71	Charlotte Hoglund	Assistant Professor	5	
8/71	Marjorie Nestor	Instructor	1	
8/71	Christina Quinn	Assistant Professor	1	Marriage
8/71	Joyce Wilkes	Instructor	1	To raise her family.

Leave of Absence Without Pay:

May B. Hall, Assistant Professor 9/1/70 - 8/31/71
to attend Boston University School of Nursing
graduate program in Mental Retardation.

STUDENTS AND CLIENTELE SERVED:

Categories -	Sept. 1968	Sept. 1969	Sept. 1970
Baccalaureate programs:			
- Without previous nursing education	312	311	339
- With previous nursing education			
Associate Degree Nursing Program	--	3	3
Diploma Nursing Program	--	16	37
Graduate Programs:			
- Medical-Surgical Nursing	5	7	15
- Psychiatric-Mental Health Nursing	--	--	Program Proposal submitted to NIMH
Sub-total:	317	337	394

Students and Clientele Served - Continued

Sub-total:	317	337	394
	Sept. 1968	Sept. 1969	Sept. 1970
Work Conferences for Employed Nurse Practitioners (R.N.'s)	25	38	25
Sub-total:	25	38	25
GRAND TOTAL	342	375	444

Secretarial -

Title	Grade	Number of Personnel Sept. 1968	Sept. 1969	Sept. 1970
Principal Clerk*	9	1	1	1
Senior Clerk-Typist**	6	0	1	1
Junior Clerk-Stenographer	4	2	2	3
Junior Clerk-Typist	3	1	1	1
Total:		4	5	6

* Maximum salary for Grade 9 position for past 5 years.

** Dependent upon annual renewal of Mental Health Grant.

Comments:

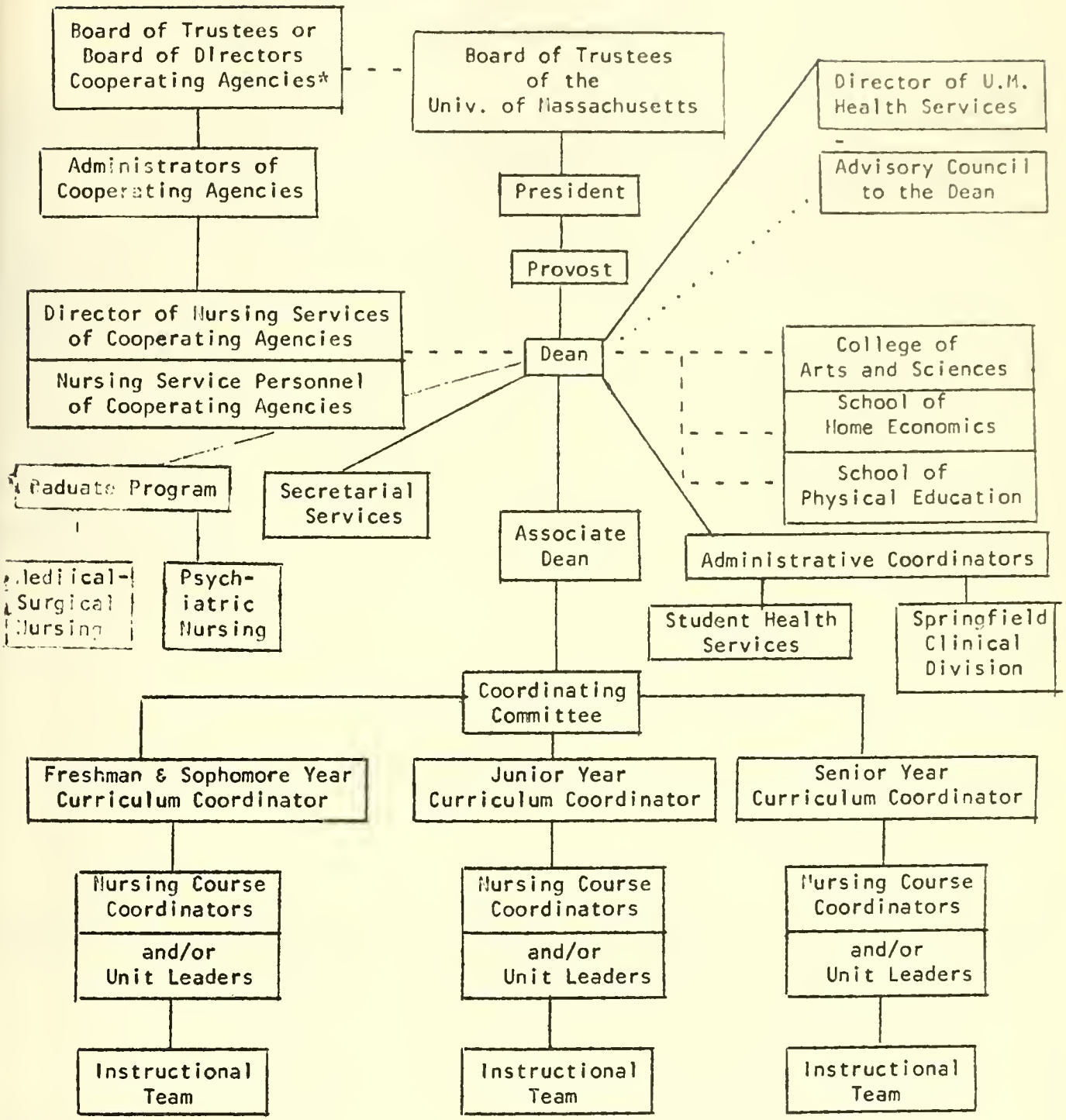
- The situation concerning the Principal Clerk's salary and job grade (no increment for 5 years) continues to be critical. She makes a unique contribution to the day by day operation of the School of Nursing as she is the one non-professional employee who is intimately knowledgeable of the many functions implicit in the efficient operation of the School.

- There is imperative need for a Staff Assistant. The administrative responsibilities and detail required by an increased number of baccalaureate students (including high school graduates, registered nurses, change of majors, transfers from other institutions) have become increasingly time consuming and demanding.

- Our second graduate clinical major in Psychiatric Nursing will become operational in the Fall of 1971. This, too, will require the services of a Staff Assistant to handle the administrative details.

UNIVERSITY OF MASSACHUSETTS
School of Nursing

Functional Chart of Organization



Legend:

_____ Direct Responsibility
- - - - Collaborative Relationship
. . . . Advisory Relationship

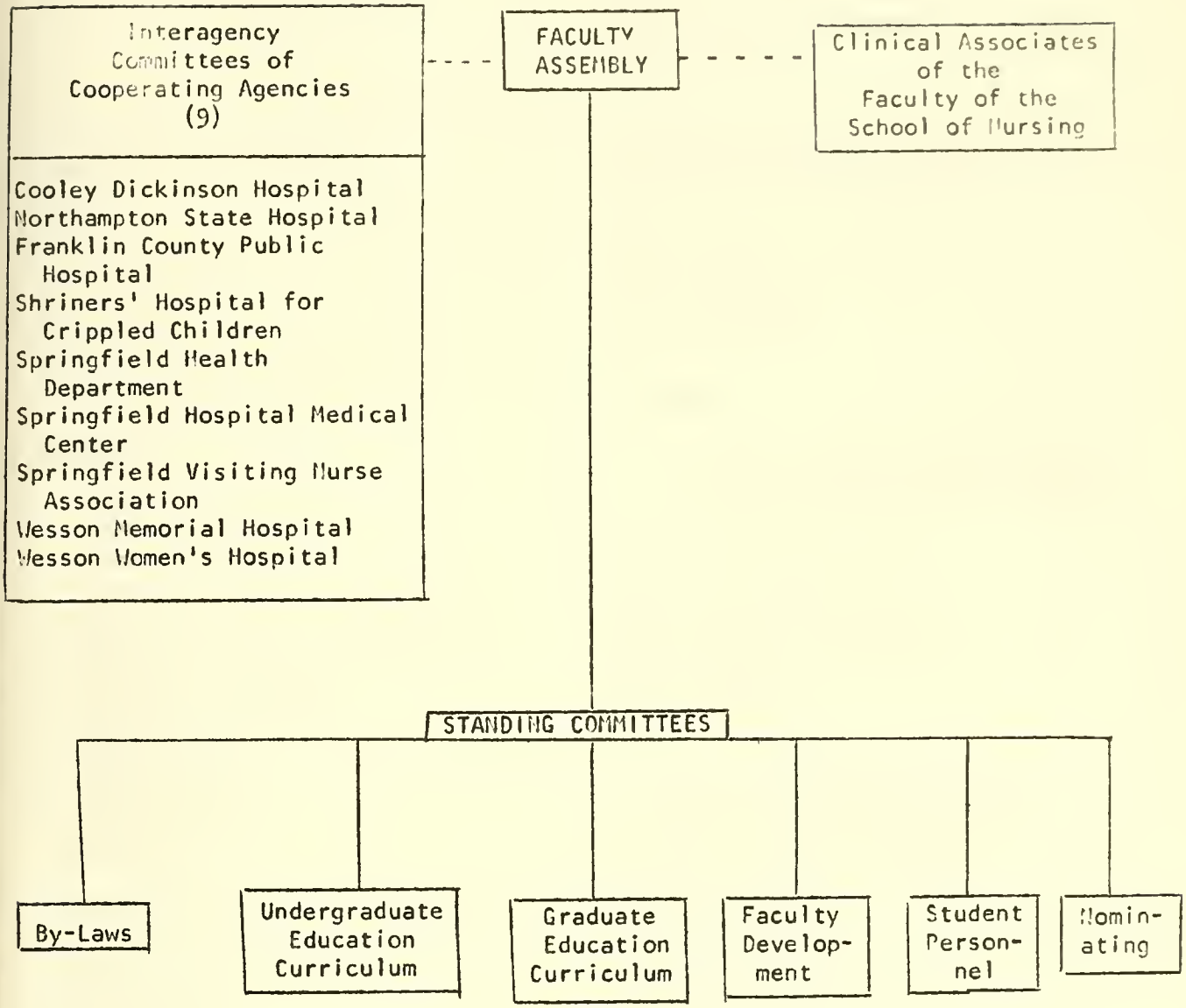
* Nine (9) Cooperating Agencies

70-71

UNIVERSITY OF MASSACHUSETTS
School of Nursing

Organization of Faculty Assembly

1970-1971



Legend:

_____ = Direct Responsibility

- - - - - = Advisory Relationship

UNIVERSITY OF MASSACHUSETTS
School of Nursing

Membership on Faculty Committees

Faculty Assembly

Lillian R. Goodman, Chairman
Jane E. Nicholson, Secretary
All faculty members

Committee on Undergraduate Education

Karen Johnson, Chairman
Jeanette Hines, Secretary
Margaret Craig (2nd Semester)
Alice Friedman
Lillian Goodman
Susan Grancio
Jane Nicholson
Christina Quinn
Ann Sheridan
Janet Simmons (1st Semester)

Students:

Barbara Larson
Jessica Singer
Barbara Zajac

Committee on Faculty Development

Helen Auton, Chairman
Faye Moore, Secretary
Hope Belitsos
Virginia Earles
Mary Helming
Greta Salenius
Edith Walker

Committee on Student Personnel

Susan Grancio, Chairman
Elizabeth Clarke, Secretary
Nina Entrekin
Barbara Redding
Loretta Sharp

Students:

Susan Burstein
Mary Hughes

Committee on By-Laws

Alvin Winder, Chairman
Madeline Murphy, Secretary
Nina Entrekin
Jeanne Lehman
Barbara Redding

Sub-Committee on Curriculum Problems of R.N. and Transfer Students

Karen Johnson, Chairman
Faye Moore, Secretary
Mary Condron
Lillian Goodman
Jane Nicholson

Students:

Robert Allen (2nd Semester)
Sr. Mary Donohue (1st Semester)
Christine Lassen (2nd Semester)

Nominating Committee

Barbara Redding, Chairman
Ruth Smith, Secretary
Helen Auton
Loretta Eiben
Loretta Sharp

Graduate Curriculum Committee

Virginia Earles, Chairman
Loretta Sharp, Secretary
Lillian Goodman
May Hall (LOA)
Mary Helming
Hildegard Salenius
Alvin Winder

Ad Hoc Steering Committee

Alice Friedman, Chairman
Christina Quinn, Secretary
Margaret Craig
Lillian Goodman
Susan Grancio
Jeanette Hines
Ann Sheridan

Students:

Barbara Larsen
Jessica Singer
Barbara Zajac

Self Study Committee

Mary Helming, Chairman
Stephen Rollins, Secretary
Hope Belitsos
Virginia Earles
Lillian Goodman
Susan Grancio
Hildegard Salenius
Ruth Smith

Students:

Patricia Mozgala
Eileen Sjoberg

Others:

Norma J. Anderson, Associate Professor of Education
Mrs. Rhonda Honigberg, Consumer
David Bischoff, Associate Provost
William Darity, Department Head, Public Health
Robert Gage, Director of Health Services
Arthur Gentile, Associate Dean Graduate School
Ellis Olim, Department Head, Human Development
Harold Rausch, Professor, Psychology Department
Richard Saunders, Associate Dean, Academic Affairs, UM/Worcester

Task Force #1 - Philosophy of the Curriculum

Faye Moore, Chairman
Elizabeth Reader, Secretary
Susan Bjorklund
Alice Friedman
Marjorie Nestor
Jane Nicholson
Loretta Sharp
Alvin Winder

Student:

Jessica Singer

Task Force #2 - Professional Methodology

Hildegard Salenius, Chairman
Ann Sheridan, Secretary
Elizabeth Clarke
Mary Condron
Karen Johnson
Madeline Murphy
Christina Quinn

Student:

Patricia Mozgala

Task Force #3 - Scholarly Skills

Barbara Redding, Chairman
Charlotte Hoglund, Secretary
Hope Belitsos (1st Semester
Charlene Cotting
Margaret Craig (2nd Semester)
Susan Grancio (1st Semester)
Elaine LaMonica

Task Force #4 - Technical Skills

Jeanette Hines, Chairman
Ruth Smith, Secretary (Resigned from Committee)
Loretta Eiben
Nina Entrekin
Jeanne Lehman
Janet Simmons (Resigned)
Helen Whitbeck

Task Force #5 - Self-Actualization

Joan Sweeney, Chairman
Helen Auton, Secretary
Mary Helming
Constance Petrunenko
Edith Walker

Interagency Administrative Committees:

Cooley Dickinson Hospital

Karlene Bjorklund
Mary Condron
Loretta Eiben
Jane Nicholson

Northampton State Hospital

Charlotte Hoglund
Hildegard Salenius
Helen Whitbeck

Springfield Health Department &
Springfield V.N.A.

Lillian R. Goodman, Chairman
Ruth A. Smith, Secretary
Charlene Cotting
Alice Friedman
Jeanette Hines
Constance Petrunenko
Edith Walker

Springfield Hospital Medical Center

Loretta Sharp, Chairman
Nina Entrekin
Susan Grancio
Mary Helming
Faye Moore
Ann Sheridan

Wesson Memorial Hospital

Jane Nicholson, Chairman
Karen Johnson, Secretary
Elizabeth Clarke
Mary Condron
Madeline Murphy
Christina Quinn
Elizabeth Reader

Wesson Women's Hospital

Lillian R. Goodman, Chairman
Edith Walker, Secretary
Jeanette Hines

FACULTY CONTRIBUTIONS:

University -

Senators of the School:

Lillian R. Goodman
Alice H. Friedman
Alvin Winder

Senate Committees:

Elaine Barkin - Continuing Education Liaison on Health Programs, Member
Elizabeth Clarke - International Programs Advisory Committee, Member
Distinguished Teacher Award Committee, Member
Virginia Earles - Graduate Council, Member
Lillian Goodman - Continuing Education, Member
Faculty Senate, Member
Mary Helming - Library Committee, Member
Tenure and Grievance Committee, Member
Recognized Student Activities
United Christian Foundation
Karen Johnson - Ad Hoc Committee on Disadvantaged Students, Member
Committee on Student Grievance, Member
Faculty Affairs, Member
Subcommittee on Liability, Member
School of Nursing Honor Society, Member
Constance Petrunenko - Continuing Education, Member
Loretta Sharp - Summer Session, Member
Academic Matters, Member
School of Nursing Honor Society, Member
E. Ann Sheridan - University Affairs, Member
Distinguished Teacher Award, Member
Ruth Smith - Liaison with University Health Services, Member
Edith Walker - Continuing Education, Member
Alvin Winder - WFCR Investigating Committee, Member

Other:

Lillian R. Goodman - Dean's Council, Member

Residence Fellows:

Alvin Winder - Orchard Hill Complex

Extra-University Service:

Elaine Barkin - Symposium: Current Social Work Practices in Extended Care Facilities and Home Health Agencies, sponsored by Mass. Department of Public Health in Boston, Group Leader, February 18.

Elaine Barkin - Smith College School of Psychiatric Social Work, Boston.

Mary Helming - Speaker, Annual Meeting District II, Worcester, September 16, 1970, Topic: Progress of MNA 1969-70.

Karen Johnson - Nursing Television (Boston College) Subcommittee to consider Cross Registration and Transfer of Credit, Spring Semester.

Inter-University:

Lillian R. Goodman - Master Planning Committee, Member

Consultants to School of Nursing and Faculty:

Ida Orlando Pelletier, Author - DYNAMIC NURSE-PATIENT RELATIONSHIP, G. P. Putnam's Sons - Interpersonal Relationships and Nursing Process.

Mary Malone, Director, ODWIN (Open the Doors Wider in Nursing); Author and Director of Study: EDUCATIONAL HORIZONS FOR NURSING IN MASSACHUSETTS (prepared for the Massachusetts Board of Higher Education).

Dr. Laurel A. Copp, Acting Head of the Department of Nursing, College of Human Development, Pennsylvania State University - The Human Development Model.

Dr. Anne Kibrick, Director Graduate Program, Boston College School of Nursing; Member, National Commission for the Study of Nursing and Nursing Education; President, National League for Nursing.

Dr. Ruth T. McGorry, Dean School of Nursing Faculty of Health Sciences, State University of New York at Buffalo.

Contributions to Professional Organizations:

Elaine Barkin - Dept. of Public Health Advisory Committee on Rules and Regulations for Long Term Care Facilities (Boston), Member.

Elaine Barkin - Governors Board of Registration for Licensing of Nursing Home Administrators Commission, Spring Sepester, Member

Elaine Barkin - Pioneer Valley National Association of Social Workers, (Holyoke) Member.

Elizabeth Clarke - Massachusetts Nurses' Association, Member

Susan Grancio - Massachusetts Nurses' Association, Member

Mary Helming - Massachusetts Nurses' Association, Member

Karen Johnson - Massachusetts Nurses' Association, Membership Committee, Member

Ruth A. Smith - Massachusetts Nurses' Association, Member

Helen Whitbeck - Massachusetts Nurses' Association, Member

Elizabeth Clarke - New England Council of Higher Education in Nursing, Member

Lillian R. Goodman - New England Council of Higher Education in Nursing, Member

Karen Johnson, New England Council of Higher Education in Nursing, University of Massachusetts Representative, Member

Barbara Redding, New England Council of Higher Education in Nursing, Member

Ruth Smith - New England Council of Higher Education in Nursing, Member

Edith Walker - New England Council of Higher Education in Nursing, Member

Constance Petrunenko - Massachusetts Public Health Association, Member

Ruth Smith - Massachusetts Public Health Association, Member

Ruth A. Smith - American Public Health Association, Member

Mary Helming - American Nurses' Association, Member

Helen Auton, American Heart Association, Member

Nina Entrekin, American Heart Association, Member

Ann Sheridan, American Heart Association, Member

Barbara Redding - Massachusetts Heart Association, Member

Loretta Sharp - Massachusetts Heart Association, Member

Barbara Redding - American Association for Child Care in Hospitals, Member

Loretta Sharp - American Association for Child Care in Hospitals, Member

E. Ann Sheridan - American Association for Child Care in Hospitals, Member

Attendance at Professional Meetings:

Date	Nature of Meeting & Location	Faculty Attending
1970 Sept. 3	Mass. Federation of Nursing Home Administrators Education Committee, Dedham, Mass.	Elaine Barkin
Sept. 23	March of Dimes, "The Adolescent of Today" Springfield, Mass.	Loretta Sharp
Sept.	Massachusetts Nurses' Association Board of Directors Meeting, Boston, Mass.	Mary Helming
Oct. 11, 15, 18	Low Income Nutrition, Extension USDA, Springfield, Mass.	Constance Petrunenko
Oct. 20	Massachusetts Public Health Association Board Meeting, Boston, Mass.	Constance Petrunenko
Oct. 20	Massachusetts Public Health Association, Fall Meeting, Chestnut Hill, Mass.	Ruth Smith

Date	Nature of Meeting & Location	Faculty Attending
)ct. 21	Massachusetts Nurses' Association, District I West Springfield, Mass.	Elizabeth Clarke Mary Helming Karen Johnson
)ct 26 - 30	American Public Health Association Annual Meeting, Houston, Texas	Alice Friedman Ruth Smith
)ct.	Conn. League for Nursing/ Conn. Nurses' Association "Future of Nursing Education", Hartford, Conn.	Mary Condron
)ct.	Adolescent Symposium, March of Dimes, Springfield, Mass.	Nina Entrekin
Nov. 2, 3	Massachusetts Nurses' Association, Clinical Program, Boston, Mass.	Susan Grancio
Nov. 12 - 23	American Heart Association Convention, Atlantic City, New Jersey	Helen Auton Nina Entrekin
Nov. 12 - 23	TB and Respiratory Disease Association, Springfield, Mass.	Karen Johnson
Nov.	National League for Nursing, Baccalaureate and Higher Degrees, Miami, Florida	Virginia Earles Lillian Goodman
Nov.	Massachusetts Nurses' Association, Board of Directors Meeting, Boston, Mass.	Mary Helming
Dec. 16	Easter Seal, "Home Health Care", Springfield, Mass.	Elaine Barkin
Dec. 17	American College of Nursing Home Administrators, Region I, Holyoke, Mass.	Elaine Barkin
1971 Jan. 12	Massachusetts Federation of Nursing Home Administrators Education Committee, Dedham, Mass.	Elaine Barkin
Jan. 15	Massachusetts Public Health Association Board Meeting, Boston, Mass.	Constance Petrunenko
Jan.	Massachusetts Nurses' Association, Board of Directors Meeting, Boston, Mass.	Mary Helming
Feb. 11	Massachusetts Nurses' Association, District I Legal Aspects - Drug Problem, Springfield, Mass.	Elizabeth Clarke
Feb.	American Association of Deans of Collegiate Schools of Nursing, Washington, D.C.	Lillian Goodman
Feb.	Pediatric Lecture Series, Springfield Hospital Medical Center, Springfield, Mass.	Ann Sheridan
Feb.	AGPA, Los Angeles, California	Alvin Winder
Mar. 10- Apr. 23	New England Council of Higher Education in Nursing, Annual Meeting, Providence, Rhode Island	Elizabeth Clarke Ruth Smith

Date	Nature of Meetings and Location	Faculty Attending
Mar. 10	Massachusetts Nurses' Association, District I, Springfield, Mass.	Karen Johnson
Mar. 21 - 24	American Orthopsychiatric Association, "Population and Mental Health", Washington, D.C.	Elaine Barkin Margaret Craig
Mar. 29 - Apr. 2	"Evaluation of Nursing Student in Clinical Practicum", University of Iowa School of Nursing, Iowa City, Iowa	Karen Johnson
Mar.	Pediatric Lecture Series, Springfield Hospital Medical Center, Springfield, Mass.	E. Ann Sheridan
Apr. 2	American Nurses' Association Regional Conference on Forcasting Nursing for the Decade Ahead, University of Conn. Storrs, Conn.	Mary Helming
Apr. 14	Hampshire County Public Health Association Meeting, University of Mass. Campus Center, Amherst, Mass.	Mary Helming
Apr. 14	Western Mass. Heart Association, "Related to Care of the Infant with Cardiac Defect"	Barbara Redding Loretta Sharp
Apr. 16	STAT Colloquium at Massachusetts General Hospital, Boston, Mass.	Alice Friedman Lillian Goodman Ruth Smith Joan Sweeney
Apr. 17	American Heart Association, "Heart of a Child", University of Mass., Amherst, Mass.	E. Ann Sheridan
Apr. 21	Massachusetts Public Health Association, "Health Centers", Boston, Mass.	Constance Petrunenko
Apr. 21	Massachusetts Public Health Association Annual Meeting, Canton, Mass.	Ruth Smith
Apr. 29	Massachusetts Nurses' Association, Special Interest Group on MR, Framingham, Mass.	Helen Whitbeck
Apr.	Massachusetts Nurses' Association Board of Directors, Boston, Mass.	Mary Helming
Apr.	Pediatric Lecture Series, Springfield Hospital Medical Center, Springfield, Mass.	E. Ann Sheridan
Apr.	Cystic Fibrosis Association, Atlantic City, New Jersey	Alvin Winder
May 9 - 12	National League for Nursing Biennial Meeting, Dallas, Texas	Elizabeth Clarke Lillian Goodman
May 19 - 22	American Association of Child Care in Hospitals, 6th Annual Conference, "Needs of Children in Hospitals", New York.	Barbara Redding Loretta Sharp E. Ann Sheridan

Date	Nature of Meeting and Location	Faculty Attending
June 10	Massachusetts Heart Association, "A Nursing Seminar on Cardio-Pulmonary Problems in the Neonate," Western Massachusetts Hospital.	Barbara Redding
June 11-13	New England Council of Higher Education in Nursing, 6th Inter-University Faculty Work Conference, Round Hills, So. Dartmouth, Mass.	Barbara Redding
Spring	Massachusetts Nurses' Association, District I, Board of Directors Meeting, Northampton, Mass.	Karen Johnson

MAJOR ACCOMPLISHMENTS:

1. Initial accreditation of the Graduate Program in Nursing (including 2 clinical specialty areas: Medical-Surgial Nursing and Psychiatric-Mental Health Nursing) by the National League for Nursing on December 11, 1970.

2. Notice of Grant Award from the National Institute of Mental Health for five years support (7/1/71 through 6/30/76) of the Graduate Program in Psychiatric-Mental Health Nursing issued on May 7, 1971 and received on May 28, 1971.

3. On May 26, 1971 the Faculty Assembly of the School of Nursing unanimously voted acceptance of a major curriculum change to the model of an upper division major. (Appendix I). The faculty is committed to producing the course proposals during 1971-72 which are necessary for implementation of the new curriculum.

4. The Self-Study Committee of the School has worked zealously since February, 1971. A verbal report of its activities was given to Vice-Chancellor Gluckstern. It is anticipated that a written report will be presented to the University Administration early in the fall semester, 1971.

5. The School of Nursing sponsored a Founder's Day Program on October 3, 1970 in honor of Dean Emeritus Mary A. Maher. Dr. Ellen Fahy, Dean of the School of Nursing at Stony Brook was the guest speaker. The program was well attended by nursing leaders from New England and the national scene was represented by Jessie M. Scott, Assistant Surgeon General of the Public Health Service and Director of the Division of Nursing, Bureau of Health Manpower Education, National Institutes of Health.

   The establishment of the Mary A. Maher Scholarship Fund was announced to which friends and colleagues of Dean Maher contributed some $6,000.

Student Achievement:

Baccalaureate Nursing Students (exclusive of R.N. Students)

Class		No. Honor Students (C.Q.P.A. 3.0 or higher - Spring Semester 1971)	
1971		25	
1972		15	
1973		31	
1974		61	
	Total	132	(Approximately 39% of total enrollment)

R.N. Students 24

Faculty-Student Communication:

The Student Personnel Committee scheduled monthly coffee hours for the purpose of enhancing student-faculty dialogue. These were well attended throughout the year. A Student-Faculty Assembly was held early in the fall semester.

COMSON (Communication, School of Nursing) was published twice by this Committee.

In addition, meetings were held with the R.N. students, as needed, for the purpose of meeting their special problems.

Undergraduate Psychiatric-Mental Health Nursing:

The continuation grant has been funded for a third year. One student (male, Associate Degree in Nursing) received a stipend this year. Reconstruction of the course in Psychiatric-Mental Health Nursing continues in the direction of providing more community based experiences for the students. The emphasis is on prevention, treatment, and rehabilitation.

A part-time social worker has focused on extending the students knowledge and awareness of community mental health facilities.

Laboratory in Community Nursing:

This project (funded by the U. S. Public Health Service) continues to improve and expand learning experiences for our students in the Brightwood area of Springfield. Increasing numbers of students have participated more extensively in the utilization of this area in terms of their learning and giving service to the residents.

The offering of the Community Nursing course in the summer enables us to function there throughout the year. It also provides opportunity for R.N. students to progress more rapidly in the program.

The health community of Springfield recognizes the work of the School of Nursing in this community laboratory and seeks consultation and support from us in many ways.

We have also been recognized by the Federal Housing Authority to the extent that we have been provided with "double the space" for use.

There is increasing support from the faculty as a whole. Three different courses offer clinical nursing experiences in the laboratory. Other faculty members have visited and observed the program throughout the year.

Graduate Program in Psychiatric-Mental Health Nursing:

On May 28, 1971 the Project Director, Dr. Hildegard M. Salenius, received notification of a Grant Award for five years support (7/1/71 through 6/30/76) from the National Institute of Mental Health.

The first graduate students accepted into this second major clinical area in nursing will begin in September, 1971.

The primary focus of the program will be to prepare clinical nursing specialists in Psychiatric-Mental Health Nursing to work in the many facets of Community Psychiatry.

Publications:

Earles, Virginia. Behavioral Responses in Nursing Care of the Patient with Medical-Surgical Disorders", McGraw-Hill Book Co., 1971.

Walker, Edith, Lee, A., Martocchio, B. "Development of a Research Attitude in Baccalaureate Nursing Students", Nursing Outlook, Summer, 1971.

Winder, Alvin, Ph.D.

"A Critique on Jensenism", The Massachusetts Review, Winter, 1971.

"Why Black Women Don't Enter Nursing", Nursing Forum, Summer, 1971.

"A Descriptive Study of Community in a Men's Residence Hall", N.A.S.P.A. Journal, No. 3, January, 1971.

Groups in a Changing World, An Introduction to T-Groups and Group Psychotherapy, Dee Appley, Van Nostrand Rienhold, in press.

FUTURE PLANS AND NEEDS:

At this point in time, long range plans are contingent upon the recommendations of the Self-Study Committee of the School of Nursing and resultant actions by the University Administration and Board of Trustees.

Specific personnel and equipment needs are included in our budget requests for Fiscal Year 1972 and Fiscal Year 1973.

Graduate Education

The faculty of the School accepts the main thrust of the "Ten Year Plan"

(submitted to Administration for 1968-78) that the School of Nursing expand its graduate program and significantly decrease its undergraduate program.

The faculty is commited to this goal for it views the main responsibility of this University School of Nursing to develop and extend graduate education in nursing in the Commonwealth of Massachusetts. This is in accord with the recommendation of the Mass. Board of Higher Education that the University School of Nursing provide leadership in nursing education, particularly graduate, in Massachusetts.

At least one well qualified (doctoral degree) research specialist faculty member must be recruited by the fall of 1972. As this faculty moves toward expansion of its graduate programs, it is imperative to engage in research.

Another well qualified faculty member must be recruited by fall, 1972 to initiate a third clinical nursing graduate program in Maternity Nursing.

It is anticipated that the graduate program will utilize the resources of the University Medical Center in Worcester for clinical nursing and research experiences.

Undergraduate Education

As noted earlier in this report, the faculty in working on a major curriculum revision, has voted to implement an upper division major in Nursing. To meet this objective, the course proposals will be prepared in 1971-72 for submission to the Faculty Senate Committee on Academic Matters. The plan is that the freshman class entering the School of Nursing in September, 1971 will be the last freshman class. Starting in September 1972, the nursing major will begin with the junior year.

Physical Facilities for the School of Nursing

Again, dependent upon the report of the Self-Study Committee and resultant implementation, there is need for a building which can be readily identified as the School of Nursing.

Faculty offices are over-crowded; some offices designed for one have been tripled, and former classrooms have been renovated to provide office space. There is pressing need for a modern facility wherein teaching-learning opportunities may be enhanced. For example, there is great need for an auto-tutorial laboratory which would promote student independence and increase faculty utilization.

Since the initiation of the Nurse Training Act of 1964, University schools of nursing in other parts of the state and country have capitalized on the availability of matching Federal Grants for their schools of nursing.

Appointment of a Dean

It is imperative that the recommendations of the Self-Study Committee be presented to University Administration as early in 1971 as possible so that a search committee may be appointed to select a candidate for the Deanship.

ADDENDUM

UNIVERSITY OF MASSACHUSETTS
School of Nursing

Faculty

Fall, 1970

Administration:

Miss Mary A. Maher, R.N. (Rhode Island Hospital School of Nursing); B.S. (Columbia University), M.A. (Columbia University)

Dean Emeritus, School of Nursing

Miss Lillian R. Goodman, R.N. (Peter Bent Brigham Hospital); M.S. (Boston University School of Nursing); Ed. D. (Boston University School of Education)

Acting Dean, School of Nursing

Miss Jane Nicholson, R.N. (Mt. Auburn Hospital School of Nursing); B.S. University of Utah School of Nursing); M.S. Boston University

Registrar, and Associate Professor, Medical and Surgical Nursing

Maternal and Child Nursing

Mrs. Jeanette Hines, B.S.N. (Cornell University-New York Hospital School of Nursing); R.N.; M.A. (San Francisco State College); M.A. (New York University)

Assistant Professor, Maternal and Child Nursing

Mrs. Marjorie Nestor, B.S. (University of Massachusetts School of Nursing); R.N.

Instructor, Maternal and Child Nursing

Miss Barbara Redding, B.S. (St. Joseph's College); R.N. ; M.A. (University of Pennsylvania)

Assistant Professor, Maternal and Child Nursing

Miss Loretta R. Sharp, B.S.N. (University of Colorado); R.N.;M.A. (University of Chicago)

Associate Professor, Maternal and Child Nursing

Miss E. Ann Sheridan, R.N. (Catherine Laboure School of Nursing); B.S.N. (Boston College); M.S.N. (University of Pennsylvania)

Assistant Professor, Maternal and Child Nursing

Miss Edith G. Walker, R.N. (Episcopal Hospital of Philadelphia); B.S.N. (University of Pennsylvania); M.A. (Columbia University)

Associate Professor, Maternal and Child Nursing

Medical and Surgical Nursing

Miss Helen M. Auton, B.S.N. (Florida State University); R.N. (Jackson Memorial Hospital School of Nursing); M.N. (Emory University)

Instructor, Medical and Surgical Nursing

Mrs. Hope Belitsos, B.S. (University of Massachusetts School of Nursing); M.S. (University of Massachusetts School of Nursing)

Instructor, Medical and Surgical Nursing

Mrs. Karleen S. Bjorklund, B.S.N. (University of Wisconsin); R.N.

Clinical Instructor, Medical and Surgical Nursing

Miss Elizabeth A. Clarke, A.B. (Mount Holyoke College); M.A. (Columbia University); M.N. (Yale University, School of Nursing); R.N.

Associate Professor, Medical and Surgical Nursing

Miss Mary F. Condron, R.N. (St. Francis Hospital School of Nursing); B.S.N.E. (The Catholic University of America); M.S.N. (The Catholic University of America)

Associate Professor, Medical and Surgical Nursing

Mrs. Loretta Eiben, B.S. (University of Iowa); R.N.;M.S. (University of Iowa)

Assistant Professor, Medical and Surgical Nursing

Miss Nina Entrekin, B.S.N. (Emory University School of Nursing); R.N.;M.N. (Emory University School of Nursing)

Instructor, Medical and Surgical Nursing

Mrs. Susan Grancio, B.S.N. (Georgetown University School of Nursing); R.N.; M.S. (New York University)

Instructor, Medical and Surgical Nursing

Mrs. Mary E. Helming, R.N. (Mass. General Hospital School of Nursing); B.S. (Simmons College); M.S.N. (The Catholic University of America)

Professor of Nursing

Miss Karen R. Johnson, B.S.N. (Hamline University); R.N.;M.Ed. (University of Minnesota)

Assistant Professor, Medical and Surgical Nursing

Miss Elaine L. LaMonica, B.S. (Columbia Union College); R.N.;M.N. (University of Florida)

Instructor, Medical and Surgical Nursing

Miss Jean E. Lehman, B.S.N. (University of Mississippi School of Nursing); M.N. (Nell Hodgson Woodruff School of Nursing)

Instructor, Medical and Surgical Nursing

Miss Faye Moore, B.S.N. (Emory University); R.N.;M.N. (Emory University)

Instructor, Medical and Surgical Nursing

Mrs. Madeline Murphy, R.N. (Springfield Hospital School of Nursing); B.S.N (Boston University); M.S. (Boston University)

Assistant Professor, Medical and Surgical Nursing

Miss Christina E. Quinn, A.B. (Smith College); M.S. (Graduate School of Nursing New York Medical College)

Assistant Professor, Medical and Surgical Nursing

Mrs. Elizabeth H. Reader, R.N. (Boston City Hospital School of Nursing); B.S. (Boston College); M.S.N. (Catholic University of America)

Instructor, Medical and Surgical Nursing

Miss Joan Sweeney, R.N. (Springfield Hospital School of Nursing); B.S. (Teachers College, Columbia University); M.A. (Columbia University)

Assistant Professor, Medical and Surgical Nursing

Mrs Joyce H. Wilkes, B.S. (Syracuse University); M.S. (University of Massachusetts School of Nursing)

Instructor, Medical and Surgical Nursing

Psychiatric-Mental Health Nursing

Mrs. Elaine R. Barkin, A.B. (Smith College); M.S.S. (Smith School of Psychiatric Social Work)

Lecturer, Psychiatric-Mental Health Nursing

Mrs. Margaret Craig, B.S. (Columbia University); M.S. (Boston University)

Instructor, Psychiatric-Mental Health Nursing

*Mrs. May B. Hall, R.N. (St. Barnabas Hospital for Women and Children); B.S.N.E. (Marquette University); M.S. (Boston University)

Assistant Professor, Psychiatric-Mental Health Nursing

Miss Charlotte R. Hoglund, R.N. (Memorial Hospital-Worcester); B.S. (University of Virginia); M.Ed. (Columbia University)

Assistant Professor of Nursing

Mrs. Janet Simmons, R.N. (Worcester Memorial Hospital); B.S. (Boston University); M.S. (Boston University)

Assistant Professor, Psychiatric-Mental Health Nursing

Mrs. Helen M. Whitbeck, R.N. (New Jersey State Hospital); B.S.N.E. (Marquette University); M.S. (Boston University)

Assistant Professor, Psychiatric-Mental Health Nursing

Dr. Alvin Winder, Clinical Psychologist, Ph.D. (University of Chicago)

Professor

Nursing in the Community

Mrs. Charlene M. Cotting, B.S. (Boston College)

Instructor, Nursing in the Community

Mrs. Alice Friedman, R.N. (Mass. General Hospital School of Nursing); B.S. (Teachers College, Columbia University); M.S. (Boston University)

Assistant Professor, Nursing in the Community

Mrs. Constance Petrunenko, R.N. (Children's Hospital School of Nursing); B.S.N. (Boston University); M.A. (Columbia University)

Associate Professor, Nursing in the Community

Mrs. Ruth A. Smith, R.N. (Mass. General Hospital School of Nursing); B.S.N. (University of Connecticut); M.N. (University of Washington)

Assistant Professor, Nursing in the Community

Graduate Programs

Miss Virginia Earles, B.S.N. (Syracuse University); R.N.;M.S.N.E. (Syracuse University)

Professor, Medical and Surgical Nursing

Miss Hildegard M. Salenius, R.N. (St. Lukes and Childrens Medical Center); B.S.N.E. (University of Denver); M.S. (University of Colorado); D.N.Sc. (Boston University)

Associate Professor, Psychiatric-Mental Health Nursing

Research

Mrs. Aloo E. Driver, B.A. (University of Bombay); M.A. (Columbia University)

Lecturer, (Part-time) Research

* On Leave of Absence for 1970-71

eb
7/9/71

UNIVERSITY OF MASSACHUSETTS
School of Nursing

Committee on Undergraduate Education

Curriculum Revision

The following motions, related to the direction for revision of the curriculum of the School of Nursing, are presented as amended and adopted by the Faculty Assembly at its May 26, 1971 meeting. You are referred to Exhibit 1 of the May 26, 1971 Report of the Committee on Undergraduate Education for the rationale for each motion.

1. The faculty accept the following statement of philosophy as the Philosophy of the School of Nursing.

   "Learning is a process the student undergoes throughout his life cycle. The major thrust of education should be seen under the heading of 'human growth and development'. Under this heading, the student is helped to grow in the cognitive, affective and motor areas of his life. He can see growth as a continuous process both in himself and in the patient. Both nursing and non-nursing courses should facilitate this concept of continuous growth.

   The purpose of the nursing major is to provide a curriculum which offers the student an opportunity to learn the practice of nursing which is herein defined as - identifying and treating human responses to actual or potential health problems through such services as casefinding, health teaching, health counseling and provision of care supportive to or restorative of life and well-being."

2. The nursing major will be in the last two years of a four year program.

3. Content in human growth and development must be taken prior to entering the nursing major.

4. A course in physiology be required prior to beginning the nursing major.

5. There would be a survey nursing course, open to all University undergraduates, which would not be pre-requisite to the nursing courses in the major.

6. While electives will be offered in nursing to allow for individual tracking, there will be a prescribed minimum number of credits in the major that will fulfill the requirements for a degree in nursing.

7. The Nursing Core is required of all students in the nursing major.

8. Content in human growth and development should be continued throughout the Nursing Core.

9. An interdisciplinary approach should be utilized in teaching the Nursing Core.

10. Nursing Models (Modules or Mini-Courses) should be utilized to provide the learning experiences for students in the prescribed Nursing Core.

11. Technical skills should be integrated in the clinical experiences throughout the program. It is essential to have a multi-media learning laboratory with prepared faculty and staff assistance.

12. Professional Methodology should be incorporated throughout the program.

13. Challenge examinations should be available and students should be able to challenge any area of the nursing program.

14. Independent Study should be incorporated into the program as an opportunity for students to pursue individual interests.

15. Students shall be involved in Growth Groups, for credit, throughout the Nursing program.

16. The Faculty accept the attached schematic design for a curriculum leading to a baccalaureate degree in nursing. (See 2a)

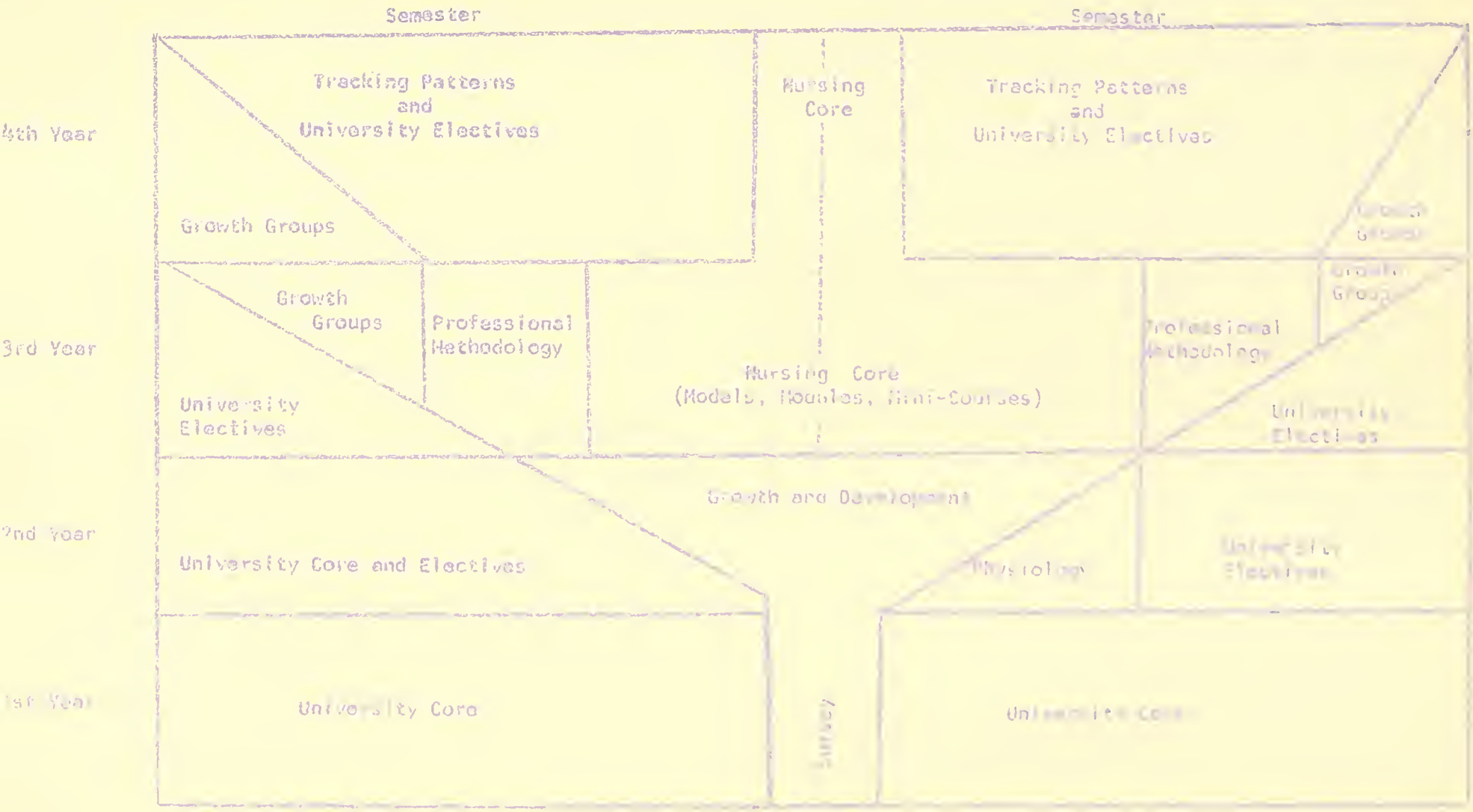
17. The following Recommendations for Faculty Involvement in Curriculum Revision be accepted for implementation as soon as possible but not later than Fall Semester, 1971.

A. The Faculty agreed to September 1 and 2 as an appropriate time for the two-day session to be held prior to the start of Fall Semester. At this time, plans will be shared as to an approach all Faculty can use in their curriculum related work groups during the academic year 1971-1972.

B. Faculty should think about the following questions during the summer:
   What is essential for students to learn in nursing?
   How might students learn it?
   How might it be evaluated?

C. The formation of small faculty-student groups to work on:
   1) Institutional objectives that reflect the Philosophy of the School of Nursing
   2) establishment of a multi-media learning laboratory.
   3) nature of the content and learning experiences comprising the proposed Survey of Nursing Course.
   4) Nature of the content and learning experiences of the Human Development prerequisite to the nursing major, as well as the first level and second level Human Development concepts to be a part of the Nursing Core.
   5) further refinement and identification of content, learning experiences and evolvement of student's Professional Methodology.
   6) Other areas to be defined

D. A Timetable will be submitted to Faculty at the fall two-day workshop. This will contain dates for completion of tasks as follows:
   - Curriculum development work completed by Fall Semester, 1971-72.
   - Plans for implementation completed by Spring Semester, 1971-72.


Semester
Semester
4th Year
3rd Year
2nd Year
1st Year
Tracking Patterns and University Electives
Nursing Core
Tracking Patterns and University Electives
Growth Groups
Growth Groups
Professional Methodology
Nursing Core (Models, Modules, Mini-Courses)
Professional Methodology
University Electives
Growth and Development
University Core and Electives
Physiology
University Core
Summer
University Core

SCHOOL OF PHYSICAL EDUCATION

ANNUAL REPORT

1970-1971

Warren P. McGuirk
Dean

David C. Bischoff
Associate Dean

UNIVERSITY OF MASSACHUSETTS, AMHERST

University of Massachusetts, Amherst

School of Physical Education

ANNUAL REPORT

1970-1971

. Budget Appropriation

Account	1968-69	1969-70	1970-71
03	$36,600	$32,400	$40,000
06	4,300	4,000	4,000
07	9,950	9,950	12,000
10	4,200	4,200	4,200
12	7,500	7,500	7,300
13	21,000	21,000	26,378
14 &14-1	18,500	18,500	16,300
15	4,500	4,000	5,260
16	300	300	962
	106,850	101,850	116,400

. Personnel[1].

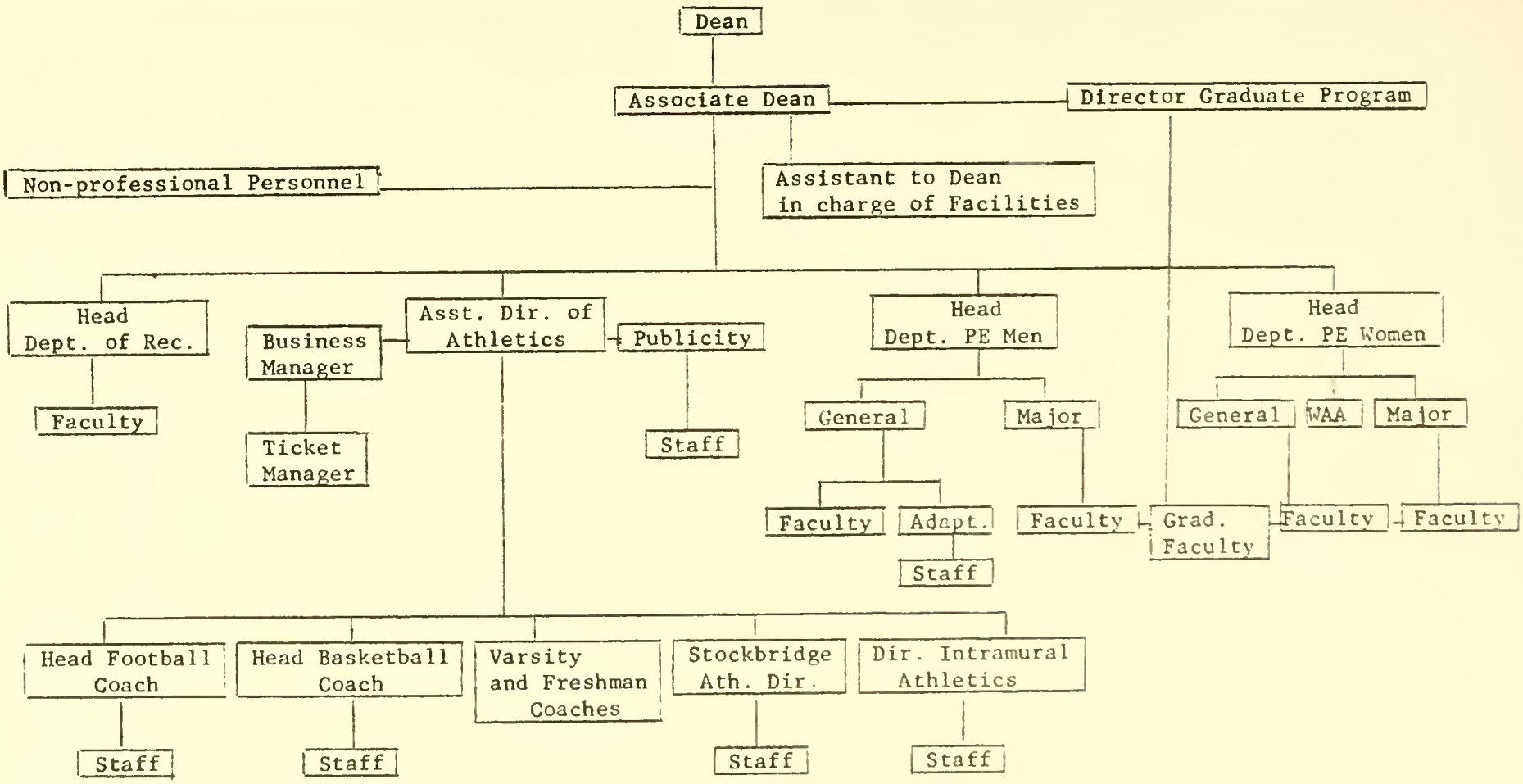
	1968-69	1969-70	1970-71
Dean	1	1	1
Associate Dean	1	1	1
Department Head	2	2	2
Professor	6	6	6
Associate Professor	8	9	10
Assistant Professor	9	11	10
Instructor	12	11	14
Part-time Instructor	1	1	0
Assistant Athletic Director	1	1	1
Head Coach	2	4	4
Intramural Director	1	1	1
Assistant Intramural Director	1	1	1
Assistant Football Coach	5	3	6
Athletic Coach	5	3	2
Assistant Athletic Coach	2	5	3
Financial Manager of Athletics[2].	1	1	1
Sports Information Director[2].	1	1	1
Assistant Sports Information Director[2].	1	1	1
Ticket Manager[2].	1	1	1
Staff Associate	0	0	1
total:	61	64	67

. Organization Chart
(see next page)

Note: 1. See appendix for Departmental breakdown.
2. Paid from Athletic Trust Funds

UNIVERSITY OF MASSACHUSETTS, AMHERST

SCHOOL OF PHYSICAL EDUCATION



June 1970

4. Students or Clientele served:[1.]

	Sept. 1968	Sept. 1969	Sept. 1970
Number of:			
Undergraduate Majors	705	758	830
Graduate Students	38	42	42
Students Taught	9,147	8,138	8,500
Athletic Team Membership	781	750	714
Intramural Participation	4,274	5,313	9,759
totals:	14,945	15,001	19,845

5. Faculty Publications, Research Grants and other Professional Activities:

a) Books:

Gerber, Ellen W. Innovators and Institutions in Physical Education. Philadelphia: Lea & Febiger, 1971.

Kroll, Walter Perspectives in Physical Education. New York: Academic Press, 1971, 373 p.

Loy, John W., Collaborator with L.A. Larson and D. E. Hermann Encyclopedia of Sport Sciences and Medicine. New York: Macmillan, 1971.

Plagenhoef, Stanley Pattern of Human Motion. Prentice Hall, New Jersey, 1971.

Randall, William E. Selected Natural Resources of the Northfield, Mass. Region. A Study compiled for Northeast Utilities, January, 1971. 201 pages including 56 figures.

b) Articles:

Berlin, Pearl "Suggested References Cybernetic Approaches to the Study of Skill Learning." EAPECW Spring Newsletter.

Edington, D. W. Pyridine Nucleotide Oxidized to Reduced Ratio as a Regulator of Muscular Performance, Experientia, Vol. 26, p. 601, 1970.

James,Robert Section 5 of HIP Federal Grant Final Report #51-P70046-1-05 Belchertown State Training School Sensory-Motor Training Program.

Kjeldsen, Kirsti "The Training of Russian Gymnasts." Modern Gymnast, July, 1970, Santa Monica, Calif.

Kroll, Walter Reliability Theory and Research Decision in Selection of a Criterion Score. In Contemporary Readings in Sport Psychology. William P. Morgan, ed., pp. 95-105. Springfield, Ill.: C.C. Thomas, 1970.

_____ Discriminant Function and Heirarchial Grouping Analysis of Karate Participants' Personality Profiles. In Contemporary Readings in Sport Psychology. William P. Morgan, ed., pp. 298-306. Springfield, Ill.: C.C. Thomas, 1970.

_____ with Lillian Crenshaw, Multivariate Personality Profile Analysis of Four Athletic Groups. In Contemporary Psychology of Sport. Gerald S. Kenyon, ed., pp. 97-106, Chicago: Athletic Institute, 1970.

_____ Personality Assessment of Athletes. In Psychology of Motor Learning. Leon Smith, ed., pp. 349-366, Chicago: Athletic Institute, 1970.

Lewis, Guy "Canadian Influence on American Collegiate Sports," Canadian Journal of History of Sport and Physical Education, 1 (Dec.1970), 7-17.

Loy, John W. (with J. F. McElvogue), "Racial Segregation in American Sport," International Review of Sport Sociology, 5 (1971), 5-24.

Loy, John W. "Mores," Encyclopedia of Sport Sciences and Medicine. New York: Macmillan, 1971, pp. 152-155.

____ (with J. N. Sage), "The Effects of Formal Structure on Organizational Leadership: An Investigation of Interscholastic Baseball Teams," Contemporary Psychology of Sport, ed. G.S. Kenyon, Chicago: Athletic Institute, 1970, pp. 363-374.

Randall, William E. "Changing Patterns of Land Use and Conservation in a Small New England Valley." Appendix to Focus: Outdoors, Speakers Notes, August, 1970, pp. 3.

Riggs, Maida L. "Tough and Tender." JOHPER, October, 1970, 41 (8), 31.

Robb, Gary M. "A Correlation Between Socialization and Self-Concept in a Summer Camp Program." Therapeutic Recreation Journal, 5(1):25-29.1971.

Sherrow, Jeanne E. "The Creativity Myth." Perspective, 4(3):8-9. 1970

Wallace, Esther M. "Fear and the Nonswimmer." Division of Girls and Women's Sports (DGWS) Selected Aquatic Articles 2nd ed. 1971, Reprint from '67-69 edition of DGWS Aquatic Guide.

c. Papers Presented

Guy Lewis, "Sport and the Making of American Higher Education: The Early Years, 1783-1875," National College Physical Education Association for Men, Portland, Oregon, Dec. 1970.

_____, "Enterprise on the Campus: Developments in Intercollegiate Sport and Higher Education, 1875-1939," Symposium on the History of Physical Education and Sport, The Ohio State University, March 1-3, 1971

Berlin, Pearl "Women's Motivations to Engage in Competitive Sport," Research Section, AAHPER, Detroit, April 5

____, "Where We Are Going in the Professional Physical Education Curriculum," Ithaca College, April 15.

____, "The Collegiate Woman Athlete: A Demographic Profile," Symposium on Sport and Society, University of Massachusetts, May 8.

Gerber, Ellen W. "The Ideas and Influence of McCloy, Williams and Nash on Modern Physical Education." The History of Physical Education and Sport, A Symposium Sponsored by the Big Ten Universities with the Cooperation of the Athletic Institute, March 1, 2, 3, 1971. The Ohio State University, Columbus, Ohio.

Loy, John W. "Social Origins and Occupational Mobility Patterns of a Selected Sample of American Athletes," 7th World Congress of Sociology, Varna, Bulgaria, Sept. 14-19, 1970.

____, "Where the Action is - A Consideration of Centrality in Sport Situations," Keynote address at the Second Annual Canadian Symposium of Psycho-Motor Learning and Sports Psychology, University of Windsor, Windsor, Ontario, Canada, Oct. 26-28, 1970.

____, "The Nature of Social Science Theory and Its Import for the Explanation of Agonetic Behavior," Major address given at the Annual Meeting of the National College Physical Education Association for Men, Portland, Oregon, Dec. 28, 1970.

____, "Critique," of "Correlates of Participation in Interscholastic Athletics" by E. A. Spreitzer and M. D. Pugh, Annual Meeting of the Ohio Valley Sociological Society, Cleveland, Ohio, April 22, 1971.

Vendien, C. Lynn, "International Understanding Through Physical Education." Des Moines, Iowa, October, 1970.

____, "Special Projects for International Relations." Des Moines, Iowa, Oct. 1970.

____, "The Use of Video Tape for Micro-Teaching and Improving Skills." Sydney, Australia, August, 1970.

____, "Physical Education and Sport in the U.S.A." Sydney, Australia, Aug. 1970.

____, "The International Scene in Health, Physical Education, and Recreation." Detroit, Michigan, April 1971.

d. Research Grants

Edington, D. W. - Massachusetts Heart Association #984. Subcellular Aspects of Myocardial Metabolism During Physical Training and Aging in Rats. January 1, 1970 to December 31, 1970. $9,746.00

James, Robert - Consultant on HIP Grant. Sensory Motor Training. Belchertown State Training School. Course Instruction in CRASH Program. Belchertown State Training School.

Kjeldsen, Kirsti - Division of Girls and Women's Sports (DGWS) Grant to revise the Training Film and Training Manual for judging women's gymnastics. Completed September, 1970.

Kroll, Walter - NIH Grant NB-07833-01. Proprioceptive Effects in Isometric Muscular Effort. 1969-1971. $19,400

Loy, John Faculty Research Grant FGR P-11-71(1) $1,000 - Jan.to July 1971. "Career Mobility Patterns of Collegiate Coaches"

e. Research Projects

Edington, D. W. - "The Effects of Aging and Physical Training on Rat Heart and Skeletal Muscle Ultrastructure."
"Effects on Acute Muscle Stimulation on Select Biochemical Intermediates."
"Effects of Acute Muscle Stimulation on Skeletal Muscle Ultrastructure."

"Effects of Physical Training on Longevity and Morbidity of Rats."

James, Robert - Motor Behavior in Institutionalized Down's Syndrome Males. In progress.

Plagenhoef, Stanley - Force of Impact Using Strain Gauge. Human Motion Analysis.

. Professional Activities -

Professional Organization	Faculty
World Congress of Sociology	Dr. Loy
Canadian Symposium of Psycho-Motor Learning and Sports Psychology	Dr. Loy
Ohio Valley Sociological Society	Dr. Loy
Symposium on the History of Physical Education and Sport, The Ohio State University	Dr. Lewis
National College Physical Education Association for Men	Professors Lewis, Loy, Kjeldsen, VanderZwaag
American Association for Health, Physical Education, and Recreation - National Convention	Dr. Loy, Dr. Berlin, Professors Patton, Vendien, Hubbard and K. Clark, J. Farr
Association of Teacher Educators, Kennebunk, Maine	Professors Barber and Beal
Eastern District of AAHPER - Philadelphia, Pa.	J. Farr, K. Kjeldsen, M. Patton
New England Exercise Physiology Conference, Boston	Prof. Kroll
Research Section, Massachusetts Association for Health, Physical Education and Recreation, Boston	Prof. Kroll
Temple University Graduate Students Assembly, Phila.	Prof. Kroll
North American Society for the Psychology of Sport and Physical Activity Conference, Detroit	Prof. Kroll
Canadian Sport Psychology & Psychomotor Learning Symposium, University of Windsor	Prof. Gerber
Eastern Association for Health, Physical Education and Recreation Convention - Bi-national Dance Conference	Prof. Patton
American Association of Health, Physical Education and Recreation Perceptual Motor Conference, Cincinnati, Ohio	Prof. Riggs
American Association of H, PE and R and National Association on Education for Young Children - Discussion Leader, "The Importance of Motor Development During Early Childhood," Washington, D.C.	Prof. Riggs
International Council on Health, Physical Education and Recreation Congress in Sydney, Australia	Prof. Vendien
North American Society for the Psychology of Sport and Physical Activity	Prof. Kroll
Olympic Committee for Canoeing	Prof. Plagenhoef
National Congress on Recreation and Parks	Prof. Randall, Prof. Sherrow, G. Robb, M. Willmann
Massachusetts Association of H, PE and R	G. Robb, J. Sherrow, M. Willmann
New England Camping Association	G. Robb, M. Willmann
New England Therapeutic Recreation Society	G. Robb
Massachusetts Recreation and Park Society	Dr. Randall, Dr. Sherrow, G. Robb, M. Willmann

Other Professional Activities

Workshops: Gymnastics Coaching Workshop at Bemidji State College, Minnesota. June 1971 K. Kjeldsen

Choreographed - "A Dance to Dance" - University of Massachusetts. September 22-23, 1970 and April 22-23, 1971 M. Patton

"Swimming Pool Safety" Lecture at National Environmental Health Association Workshop on Accidental Injury Prevention. Framingham, Massachusetts November 1970. E. Wallace

. Major Accomplishments

A. Undergraduate Program

This was the second year during which the revised curriculum for Physical Education Majors has been in effect. The greatest advantage of the program is the amount of electivity for students. Although the large majority of students still prefer to follow the teacher education routes, they are gradually coming to a clearer understanding of the differences between the professional and disciplinary curricula. The students are in a better position to plan a program which meets their individual needs.

The General Physical Education Program for all University students has also more adequately reflected student interests and needs during the past year. Every effort has been made to accommodate student interest in such courses as skiing, gliding, scuba, tai chi, aikido, and yoga. In addition, several of the traditional offerings remain popular and fulfill basic needs.

B. Master's Program

A specialization in Sport Administration was planned during this year. The program will go into effect September 1971. A flyer, describing the program, was widely distributed to high schools and colleges. Responses to this program have been most enthusiastic. There seems to be little doubt that the program will fulfill a need which has long been recognized at the national level.

C. Doctoral Program

A proposal for a Ph.D. specialization in the Social Science of Sport has been submitted to the School. If this proposal is approved, there is good reason to believe that the School of Physical Education at the University of Massachusetts will have taken a decisive step forward in achieving its goal as being the number one physical education school in the country.

D. Master of Science Degree and Ph.D. degree in Human Movement

The Master's program is oriented within the discipline of human movement without demanding a specialization in any of the subdisciplines of human movement. The doctoral program of study prepares men and women for careers as teachers and researchers to work as Exercise Science specialists within the human movement discipline. An in-depth, research-oriented preparation in exercise science (biomechanics, motor integration, and exercise physiology) is the means employed to reach this goal.

E. Recreation Department

Mr. Gary M. Robb, in September 1970, joined the department as its first specialist in therapeutic recreation. He has made a significant contribution to the work of the department and to the organization of recreation therapists in New England. He has been elected President of the Therapeutic Recreation Section of the Massachusetts Recreation and Park Society.

In October the department at a retreat camp in southern New Hampshire devoted the three-day weekend to improving communication; analyzing curricular and departmental policies, requirements, and practices; and developed recommendations for improvement. With these views as a foundation, the faculty and students proposed course revisions which received final University approval in May.

F. Department of Athletics

1) Intramurals

The Intramural Department administered and supervised four major phases of physical activity, accounting for 120,000 individual participations, an increase of 16,000 over the previous year.

The undergraduate men's program involved 18 competitive sports activities, with basketball and softball leading all team sports in popularity; wrestling the most popular combination team-individual sport; and badminton singles leading all individual sports. The highlight of the men's program was the Hamlin Pied Pipers participating in and placing fourth in the National Touch Football Championships held in Columbus, Ohio.

The Graduate-Faculty-Staff program increased 79% in participations over the previous year. The program involved 13 sport activities, with 25 departments within the University represented throughout the season. Most favored sports were volleyball and softball.

The Braves and Squaws Co-Recreational Program is becoming more popular each year. A total of 43 teams participated, with volleyball leading in popularity. A Turkey Trot was introduced for the first time, with 14 girls starting and finishing the one-mile course.

A Recreational Activity or Free Play program involved over 78,000 participations, with handball-squash a strong favorite. All available facilities were scheduled to their ultimate use.

The Women's Program with almost 500 students participating involved basketball and volleyball.

2) Intercollegiate Athletics

The 1970-71 intercollegiate athletic performances were the greatest in the School's history. Sixteen varsity teams won 71% of their contests and 13 had winning seasons. Soccer, cross country, basketball, golf and tennis won Yankee Conference championships, and baseball and spring track were prime contenders as the season entered its final week.

Redmen teams won over 130 games, the highest number ever. Wrestling, ski, and lacrosse won New England titles, with baseball in contention.

The University won the Frank Keaney Trophy for all-around Yankee Conference supremacy for the seventh year. Soccer, basketball, wrestling, and hockey had their finest season. Soccer ranked fifth in New England. Basketball had a 23-4 record and played in the National Invitational Tournament in New York for the second straight year. Wrestling had a 15-3-1 record, breaking Springfield College's 20-year New England championship streak. Hockey competed in the Eastern College Athletic Conference Division II Playoffs for the first time.

Massachusetts athletes won numerous Conference, New England, and Eastern honors. Julius Erving basketball standout gained national All American status and was the leading scorer and rebounder on the first U. S. Olympic Development Team which toured Europe during the summer.

The official dedications of the Earl E. Lorden Baseball Field, and the new eight-lane, all-weather surface Llewellyn L. Derby Track Facility were among the year's highlights.

7. Special Program

An interdisciplinary symposium on Sport and Society was held on the Amherst Campus of the University on May 7 and 8. Twenty-five scholars; including historians, philosophers, physical educators, and sociologists met to discuss their common interest in the study of the phenomena of play, games and sport.

Principal speakers were: Professor Richard D. Mandell, University of South Carolina; "The Transformation of Sport in the Twentieth Century;" Professor Pearl Berlin, UMass., "The Collegiate Woman Athlete: A Demographic Profile;" and Professor Gregory P. Stone, visiting professor at the University of Rhode Island, "Hustlers and Athletes: A Comparative Examination of Their Stages of Socio-Economic Development."

Co-directors of the symposium were Professor Charles Page, Sociology; and Professors John Loy and Harold VanderZwaag, Physical Education.

8. Future Plans and Needs

a) Athletic Department

The need of suitable facilities to satisfactorily conduct our Basketball and Ice Hockey Programs continues to be of major importance. At all home basketball and ice hockey games, spectators were turned away, including our students, due to the limited capacity of the respective facilities. It is an irony that the State University, while enjoying the position of ECAC Division II contender for the Conference Ice Hockey Championship, must depend on Amherst College for use of Orr Rink for hockey practice and home games. The Amherst College rink limits attendance of our undergraduate students to 2,000 out of a total enrollment of 15,000.

b) Recreation Department

The October meeting of the Massachusetts Recreation and Park Society will be held on the Amherst campus of the University. The Recreation Department will convene the first meeting of the Western Massachusetts Park Group. The Department will also host the regional meeting of the Society of Park and Recreation Educators. Students will be invited in an attempt to establish communication among the recreation majors at colleges in the Northeast.

In cooperation with segments of the recreation and park profession in Massachusetts, a proposal will be made to establish a Recreation Extension Program to help the many community needs. We are also in the process of developing a graduate program for Recreation and Park Educators.

c) Physical Education

A proposal for a Department of Sport has been developed (see attached) and submitted for consideration. Three programs are proposed for the department: Sport Instruction (application), Sport Education (method), and Sport Studies (theory).

Plans and needs are reflected in the attached proposal for a Department of Sport.

The proposal to establish a Department of Exercise Science was approved in the Spring by the Faculty Senate and will be reviewed for approval by the Trustee Committee on Faculty and Educational Policy and presented to the full Board of Trustees for final approval at their next meeting in October.

APPENDIX

1970-1971

Personnel by Department

1. Physical Education for Men

	1968-69	1969-70	1970-71
Department Head	1	1	1
Professor	4	4	4
Associate Professor	3	4	5
Assistant Professor	3	4	2
Instructor	6	5	7
	17	18	19

2. Physical Education for Women

Department Head	1	1	1
Professor	1	1	1
Associate Professor	5	5	5
Assistant Professor	6**	6	6**
Instructor	4	4	5
Part-time Instructor	1	1	0
	18	18	18

3. Recreation

Professor	1	1	1
Assistant Professor	0	1	1
Instructor	2	2	2

Students Serviced by Department

	Sept. 1968	Sept. 1969	Sept. 1970
1. Physical Education for Men			
Majors	360	387	418
Students Taught	4229	3187*	3619*
2. Physical Education for Women			
Majors	265	285	332
Students Taught (Majors and Others)	4045	3875	3605
3. Recreation			
Majors	80	86	80
Students Taught	153	176	143

*Includes both men and women in the General Physical Education Program.

**One Assistant Professor on leave.

June 1971

MEMORANDUM

December 7, 1970

From: Harold VanderZwaag

To: Dean Warren P. Morrill

Subject: Proposal for A Department Of Sport

Contingent on the formation of a separate Department of Exercise Science, the following is submitted for your consideration.

On November 24, 1970 the Department of Physical Education for Men (exclusive of the six exercise scientists) passed the following motion by a vote of 11 - 0: That the name of the Department of Physical Education for Men be changed to the Department of Sport.

On December 1, 1970 the Department of Physical Education for Men voted that the framework and requested support for the proposed Department of Sport should be as outlined below. The vote was 11 - 0, with two abstentions.

DEPARTMENT OF SPORT

This would be a department organized according to function. Although sport is a broad concept, it describes the basic functions of the department. Furthermore, sport is a meaningful concept in this culture. For a definition of sport as used in this content, reference is made to John Loy's article "The Nature of Sport: A Definitional Effort" which appeared in Quest X, May 1968. The relationship between sport and physical education is discussed in Harold VanderZwaag's paper, "Historical Relationships Between the Concepts of Sport and Physical Education," presented at the NCPEAM Meetings, December 1969. This would indicate the proposed role of a Department of Sport within a School of Physical Education.

Three programs are proposed for the department. These are sport instruction (application), sport education (method), and sport studies (theory). There would be some overlapping among these three programs, but each is designed with a specific function in mind.

SPORT INSTRUCTION PROGRAM
(A Program of Application)

This program would encompass part of the present General Physical Education Program. The Department of Sport would assume responsibility for certain GPE courses to be available to all University students on a co-educational basis. Among these courses would be the following:

Badminton	Golf	Scuba	Track & Field
Basketball	Gymnastics	Soccer	Volleyball
Bowling	Handball/Squash	Swimming	Weight Training
Diving	Lacrosse	Tennis	Wrestling

TA's will be allocated to the department. An effort will be made to recruit teaching assistants who are well qualified in one or more of these areas. They will be recruited with a specific teaching area in mind. One assistant may be assigned to more than one activity. In other words, there may be a TA

who teaches baseball/softball [illegible]. [illegible] approximately 15 TA's should be allocated to the department to cover this program. Each TA will be assigned [illegible] of sport skills in his area of specialty. [illegible] have responsibility for the [illegible] program, [illegible] the intramural program, etc. Again, there will be [illegible]. The [illegible] that the same faculty [illegible] courses.

SPORT EDUCATION PROGRAM
(A Program of Method)

This would basically consist of the present teacher education program. A coaching minor is planned at a later date. Course offerings in this program would consist of the following:

PE 253 - Physical Education for Elementary Schools
PE 275 - Prevention and Care of Injuries
PE 276 - Principles of Physical Education
PE 354 - Physical Education in the School
PE 370 - Organization and Administration of Physical Education
PE 381 - Administration of Intramurals
Educ. 285 - Student Teaching
Men PE 199 - Officiating
Majors Skills and Coaching Courses

Two TA's would be allocated to this program to assist in the supervision of student teachers.

A program in sport administration will also be developed at the masters' level. It will consist of sport studies courses currently in existence plus established University courses in business administration, speech, and journalism.

SPORT STUDIES PROGRAM
(A Program of Theory)

Basis for the Program

Sport is a household term and concept in this country and others. Newspapers, magazines, television, and radio programs constantly supply the public with information about that which is called "sport." With increased leisure time and greater affluence, people are either participating in or following sport in far greater numbers than ever before. To put it simply, sport has become a social institution.

In spite of this widespread acceptance, sport has remained a relatively unstudied institution. People are inclined to support and participate in sport programs without seriously considering the nature of the endeavor. This may be partly attributed to the close association between sport and play, although a strong case can be made for the idea that sport is an extension of play and should not be accepted on the same grounds.

Considerable attention has been given to the proper means of conducting sport programs. Physical educators, in particular, have focused on the conduct of sport and other forms of exercise programs in the school. In short, students have been prepared for a profession in sport or other aspects of what is commonly called physical education. But relatively little attention has been given to the body of knowledge which undergirds these professional practices.

Since, roughly, 1964 there has been a growing realization of the need for studying sport and exercise from a disciplinary perspective. Actually, this recognized need has resulted in the identification of two major areas of study, each having its own sub-fields. The two constellations are the theory of sport and exercise science.

The contemporary interest in the scholarly study of sport is partly attested to by the fact that the American Association for the Advancement of Science devoted an entire symposium to the subject at its 134th meeting held in Dallas, Texas, December 26-31, 1968. Interest had earlier been manifested by the formation of organizations such as the North American Society for the Psychology of Sport and Physical Activity, International Society for Sport Psychology, International Committee for the Sociology of Sport, and various sport medicine societies. Periodicals also reflect the disciplinary focus on sport. Some of these are the Journal of Leisure Research, International Review of Sport Sociology, and International Journal of Sport Psychology.

Some concern has been expressed that this disciplinary approach may only serve to widen the gulf between theory and practice. However, such need not be the case when the areas are properly conceived. Sport and exercise would provide the focus for both the profession and the discipline. For those who are interested in organizational charts, the work would be represented by parallel, three-tiered structures:

Exercise Science	Theory of Sport
Understanding and Communication of Exercise Science	Understanding and Communication of Sport Theory
Conduct of Exercise Programs	Conduct of Sport Programs

This proposal is concerned only with a recommended program for those who wish to prepare themselves for one of these constellations - the theory of sport. The work in this area consists of study in the following sub-fields:

1. History of Sport
2. Philosophy of Sport
3. Psychology of Sport
4. Sociology of Sport

Program

There are a variety of ways in which a curriculum focused on the social significance of sport might be structured. The following model is thus one of many which would be developed. However, it is one which appears to offer a balanced blend of content in both breadth and depth as one progresses from the undergraduate to graduate level.

Proposed Undergraduate Program

Assuming a university requirement of 120 credit hours for a bachelor's degree, the following division of course work is recommended:

University Requirements and Electives	36 hours
Theory of Sport Requirements	36 "
Related Fields Requirements	48 "
	120 hours

The theory of sport curriculum encompasses four subfields; namely, the history of sport, philosophy of sport, psychology of sport, and sociology of sport. Within each subfield students are required to take a lower division introductory course and an advanced upper division course, for a total of 24 credit hours. In addition, students are required to attend a 1-credit student-faculty seminar each of their first three years and a 3-credit seminar in their senior year. Finally, students are expected to fulfill 6 credits of independent reading and/or research (e.g., a senior thesis).

The related fields requirements consist of completing at least 12 credits of work in the departments of History, Philosophy, Psychology, and Sociology. In addition to a basic introductory course in each of these disciplines students are advised to take at least one methods course and one undergraduate seminar.

In fulfilling the general university and elective requirements students are advised to select a balance of courses from each of the three major university divisions -- humanities, physical sciences, and social sciences.

Proposed Masters Program

At the masters level students are asked to concentrate their work within two of the four subfields in the theory of sport curriculum. Students are required to take 6 credits of work in each of the two subfields they select and to complete a 6-credit thesis. In addition, students are required to complete 6 credits of work in each of their two related fields and fulfill 6 credits of electives for a grand total of 36 credit hours of course work.

Proposed Doctoral Program

Students are required to complete 54 credit hours of course work beyond the masters degree, distributed as follows:

Concentration in one subfield of the theory of sport	12 hours
Dissertation, independent reading, special problems	12 "
Work in related field	18 "
Electives	12 "
	54 hours

Implementation

A. Faculty - Nine appointments during a six-year period, as follows:

1. Institution of the program would require the appointment of four graduate faculty members, one in each of the sub-disciplines. Two years would be devoted to putting into operation the new curriculum.

2. During the intermediate stage (third and fourth years), faculty teaching in each of the related disciplines would be involved in the program as part-time instructors, thesis advisors, and consultants. Provision for this involvement would be made by granting four quarter-time appointments.

3. In the fifth and sixth years another person would be recruited at a junior professorial rank in each of the sub-disciplines. These appointments would bring to nine the faculty complement.

B. Additional Staff

1. Secretaries - one for each under faculty appointment:
   a. One the first year
   b. Two the third year
   c. Three the sixth year

2. Research Assistants - one for each professor, to be supported from departmental funds. Other such assistants would be acquired upon the ability of individuals to fund from outside sources.

3. Student Assistants - one undergraduate for each professor. Students involved would be supplied by the institution work-study program.

C. Facilities

1. Office space and seminar room

2. Sports psychology laboratory

D. Additional Costs - Expansion of the library collection

1. Current publications to be purchased from library funds

2. Acquisition of materials not currently in print would require an expenditure of from one to two thousand dollars a year for six years. The amount would be dependent upon the status of the collection.

E. Funding

1. Institution would assume responsibility for faculty, additional staff, facilities, and additional costs.

2. Possible sources of additional funds:

   a. Professional and amateur sports clubs

   b. Athletic associations - NCAA, AAU, NAIA and NSCAA

   c. Sporting goods companies

   d. Communications media - magazines, newspapers, radio and television

   e. Halls of fame and athletic foundations

   f. Endowed chairs

   g. Sporting matrons (e.g., Mrs. Payson Whitney)

   h. Foundations - Lifetime Sports and The Athletic Institute

Harold J. VanderZwaag
Harold J. VanderZwaag

HJV:hh

cc: Associate Dean Bischoff
Faculty Members, Dept of P.E.M.

ANNUAL REPORT

PLACEMENT AND FINANCIAL AID SERVICES
(July 1, 1970–June 30, 1971)

ROBERT J. MORRISSEY, Director

June 1971

Placement & Financial Aid Services
UNIVERSITY OF MASSACHUSETTS
Amherst, Massachusetts

PLACEMENT & FINANCIAL AID SERVICES

STAFF

Fortunately no change in staff took place during the year which meant more efficiency from a devoted staff familiar with the tasks at hand. Nevertheless the work load was far in excess of the man hours available and thus at times the backlog looked almost insurmountable. However the earnestness of the staff and their willingness to do a little extra even in the face of shrinking budgets and shortage of help caused most of our programs to function smoothly.

REORGANIZATION

As of July 1, 1971 the Placement & Financial Aid Services have been split.

The Financial Aid component will report to the Dean of Admissions.

The Career Planning and Placement Service will report to the Director of Human Services.

FUNCTIONS

(In Alphabetical Order)

1. CAREER AND FINANCIAL COUNSELING, although providing no fancy statistics and evidencing little glamor or excitement, nevertheless provides individuals and groups of students with a tremendous amount of satisfaction having found someone who will listen to their aspirations and hopes, will answer their queries on a practical and realistic basis, and aid them in searching out their careers and in sorting out their financial problems.

2. DRAFT REGISTRATION AND STUDENT CERTIFICATION. A Selective Service Form 109 to certify school attendance was sent to Massachusetts and other Draft Boards for each student (a total of 8,158) who requested this service. In many cases special explanations were sent to the Boards to assure that the registrants would complete academic programs in compliance with specified regulations. A considerable number of students came to the office to discuss individual and particular Selective Service problems. In many cases, whenever necessary, their Draft Boards were called, by telephone, in order to resolve problems. A total of 261 students who attained their 18th birthdays while enrolled in a semester's program were registered for Selective Service, as required by law, making it unnecessary for the students to travel away from campus in order to complete this requirement. (See Appendix D)

3. EDUCATIONAL OPPORTUNITY GRANTS were awarded to members of all undergraduate classes who qualified according to federal guidelines. With higher awards being given to disadvantaged students only 480 received grants amounting to $377,363 with about $227,000 of this awarded to students in the C.C.E.B.S. program. (See Appendix D)

4. EDUCATIONAL AND TEACHER PLACEMENT witnessed a great change in demand during the year. Excessive tax increases for schools, the economic slump and overlap of teacher time caused the dearth of teachers of the '60s to disappear. With far fewer positions available and a large number of candidates trying to enter the market, it necessitated a broader range of shopping for positions. This in turn required our sending 5,716 placement credentials to various school systems throughout the country. Needless to say this situation also brought a larger number of students to the office for counsel.

5. EMPLOYMENT INTERVIEWS were conducted by 300 employers, a reduction of 126 from last year. These employers held 3,806 interviews, again a decrease from the previous year. There was a large number (79) of employers who cancelled their visit because of cutbacks in employment needs. With hordes of college graduates coupled with unemployed workers seeking work employers were flooded with applications and did not feel the necessity of recruiting on colleges campuses. (See Appendix E)

6. GRADUATE DEGREE PLACEMENT noted a sharp increase in candidate interest with 576 placement registrants. 192 of these were interviewed by various employers who visited the campus seeking advanced degree personnel. In

October and November 29 Ph.D. candidates took a total of 117 interviews conducted by 15 employers who visited the campus to talk with Ph.D. candidates.

7. GRADUATE SCHOOL RECRUITMENT - 15 graduate schools including Ohio State, Dartmouth's School of Engineering, University of Virginia, and Harvard Medical School made arrangements to visit the University campus to talk with interested students. Appropriate publicity, faculty contacts, and all details were followed through by the placement staff.

8. JOB PLACEMENT was restrained throughout the year. Employers were very slow in making offers and highly selective. The demand for accountants declined somewhat from previous years but remained stronger than many areas such as teaching, engineering, physical science, all of which jumped suddenly to a buyers' market. Liberal arts and business administration graduates were better off this year as the market for their talents of reasoning, judgment, and leadership remained about the same as in previous years.

9. LOANS - National Defense Education Act Loans, University Short Term Loans, Nursing Student Loans, Cuban Loans, Law Enforcement Education Loans, and Graduate and Foreign Student Loans continue as the main campus source of loan assistance. The Massachusetts Higher Education Loan Program (HELP Loans obtained through commercial banks) which requires an education certificate from this office is the best outside source for our students. Our records indicate that our students borrowed $2,488,004 under these programs.

10. OCCUPATIONAL INFORMATION AND CAREER LITERATURE was used extensively during the entire year in the Placement Library. However the shortage of funds available to keep the collection up-to-date hampered the efforts of the Staff to provide the very best career literature available following counsel. One noteworthy addition was made in cooperation with the Counseling Office; the collection of Career Research Monographs published by The Institute for Research (Vocational Research) was brought up-to-date and 145 titles were added to the series. Now all graduate school catalogs are arranged in filing boxes to assist students in locating a desired catalog. In cooperation with Goodell Library, a bibliography was compiled to introduce students to selected sources of information about career opportunities and business firms which Goodwell has available which are too expensive to duplicate in our library. New job notebooks were added in the area of Educational Placement . Files were expanded throughout the year including information on fellowships and assistantships.

11. PART-TIME WORK. Many students acquired off-campus employment after consulting the Placement Office files which lists all off-campus employment opportunities reported to the Placement Office. All students employed by the University were processed by the Placement and Financial Aid Services office. A manual summarizing policies for student employment along with a wage scale for specific jobs was revised and distributed to the departments. The campus wage scale was raised so as to conform with federal minimum wage laws. A total of 4,243 students participated in some form of part-time work on campus, including the University part-time work program, the College Work-Study Program, and employment under various grants. The students earned a total of $2,047,357 from July 1, 1970 through May 31, 1971.

12. SCHOLARSHIPS AND GRANTS-IN-AID were not funded well enough to provide aid to the large number of applicants (11,160) who were worthy and needy.

3,466 freshman applicants accepted by the University and planning to attend were thwarted by the fact that only 623 were given aid. 7,694 upperclass students applied for scholarships but only 1,410 received awards.

13. SUMMER EMPLOYMENT - during the summer of 1970, 136 students worked on campus at the University and 130 students worked off-campus in non-profit agencies in their home towns, all under the federal College Work-Study Program. Contract negotiations, payroll responsibilities and administrative details require a great deal of work to accomplish these positions wherein students earned $293,772. Those on campus were employed in 42 different departments and offices. Off-campus agencies included many YMCA camps, Departments of Parks and Recreation, Boys' Clubs, Libraries, Schools, Boston's Summerthing Program, Social Security Administration, Upward Bound, and the Public Service Internship Programs. Summer work opportunities were fewer this spring than they have been during the past decade. Some jobs at resorts, in industry, in sales, and at summer camps were available, but there were many more applicants for each job than ever has been the case in times past. Several hundred students were counseled individually in regard to finding summer employment.

14. UNDERGRADUATE ASSISTANTSHIPS. 195 students were awarded a total of $111,900 in the form of Undergraduate Assistantships for the year 1970-71. Each student received a stipend of $300 per semester for an average of eight hours of work per week in the academic department of their choice.

15. VETERAN AND MILITARY AFFAIRS. As of the close of this year, there were 2,448 students enrolled for training under auspices of Veterans Administration. Of these, 1,629 were veterans, 819 were children of deceased or disabled veterans. Officer teams representing the Army, Navy, Navy Flight, Marine Corps, and Coast Guard came to campus at intervals during the year to explain Officer Candidate programs of their respective services to any students who were interested.

16. WORK-STUDY PROGRAM. The purpose of the College Work-Study Program is to expand part-time employment opportunities for students, particularly those from low income families, who are in need of earnings from part-time employment in order to pursue a course of study at any institution of higher education. For the year 1970-71, 544 students earned a total of $361,207 in wages under this program.

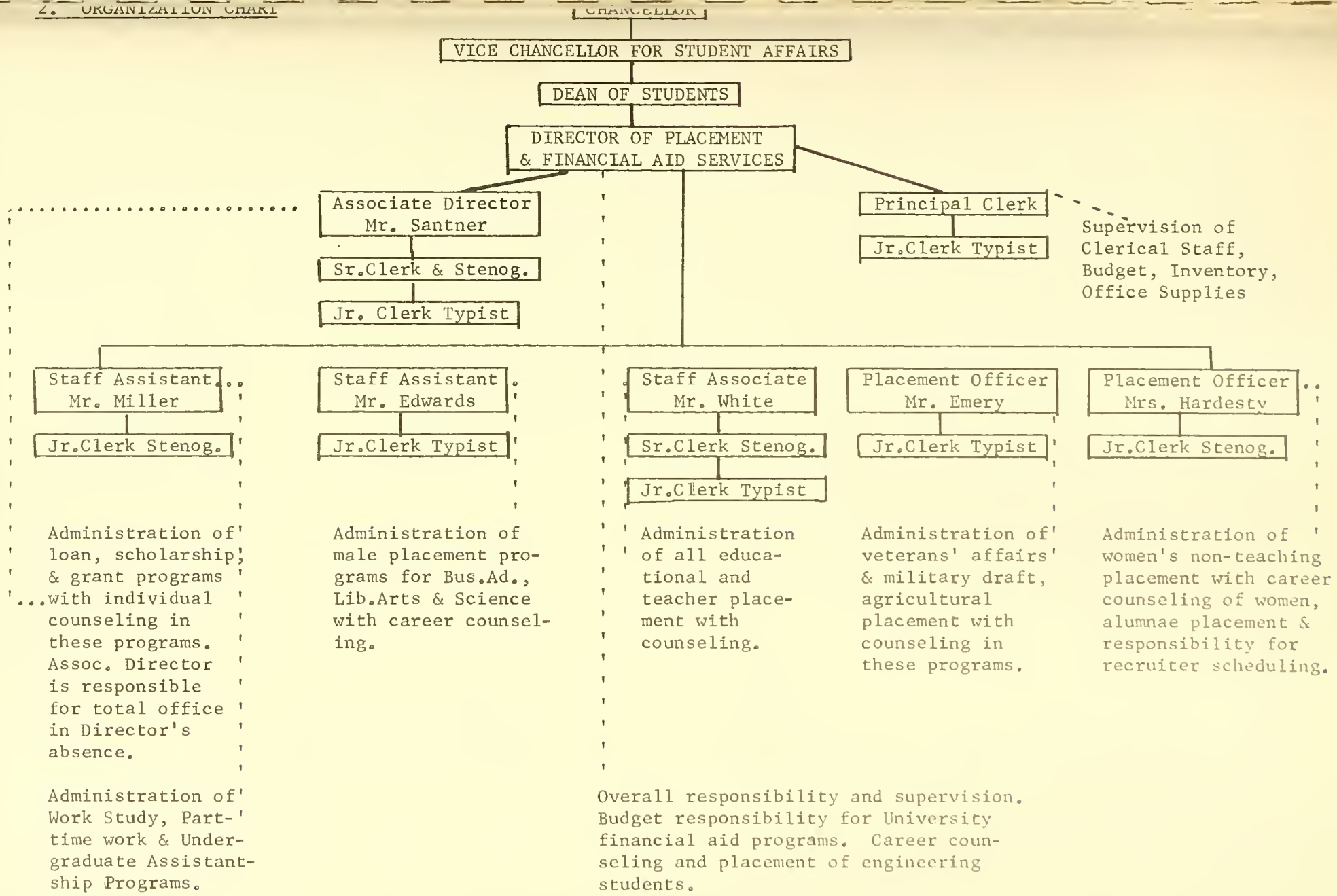
1970-71 ANNUAL REPORT OF THE PLACEMENT & FINANCIAL AID SERVICES

As per the memorandum from the Secretary of the University dated March 1, 1971, the following report of the Placement & Financial Aid Services for the period July 1, 1970 through June 30, 1971 is submitted. Supplemental data includes comments on staff, functions, and appendixes with statistics on various programs controlled through these services. Also included are statistics on the class of 1970. Information on the class of 1971 will not be available until next fall.

1. APPROPRIATION - Fiscal Year		1968-69 Actual Expenditures	1969-70 Actual Expenditures	1970-71 Allotment
Student Labor	- 03	$ -	$ 56.00	$ 500.
Travel	- 10	699.90	474.91	500.
Printing	- 11	1,146.00	701.40	1,500.
Repairs	- 12	309.92	390.05	375.
Special Supplies	- 13	1,697.63	1,958.57	2,400.
Office & Adm. Expense	- 14	2,147.01	2,340.75	2,025.
Telephones	- 14-1	3,116.80	2,683.24	2,070.
Equipment	- 15	590.00	620.00	-

2. PERSONNEL - Number in each rank	Sept. 1968	Sept. 1969	Sept. 1970
Director of Placement & Financial Aid Services	1	1	1
Associate Director of Placement & Financial Aid Services	1	1	1
Placement Officer for Women	1	1	1
Placement Officer	1	1	1
Staff Associate (Ed.Plac.Officer)	1	1	1
Staff Assistant	2	2	2
Principal Clerk	1	1	1
Senior Clerk & Stenographer	1	1	2
Junior Clerk & Stenographer	3	3	2
Junior Clerk Typist	5	5	5

2. ORGANIZATION CHART



4. STUDENTS AND CLIENTELE SERVED

A. Students - Thousands of visits to these offices were made by all categories of students - incoming freshmen, undergraduates in all schools and classes, and graduate students.

	1968-69	1969-70	1970-71
No. of seniors served and counseled re career plans and job placement	2,184 serv. 1,216 coun.	2,376 1,301	2,632 1,784
No. of seniors registered with Placement Service	1,634	1,685	1,860
No. of grad. students registered with Placement Service	387	376	566
Frosh, Soph, Jr. counseled re career plans (approx. figures)	434	450	475
Alumni served and reciprocal requests	418	425	289
Part-time student workers (See Appendix A)	4,388 (inc.1537 Work-Study)	3,847 (inc. 910 Work-Study)	4,243 (inc. 894 Work-Study)
Students counseled and/or served re loans (See Appendix B)	3,558	3,740	4,117
Students served re scholarships & financial aid (See Appendix C)	11,570	13,423	11,160
Students served and/or counseled re military draft (See Appendix D)	9,465	7,565	8,158
Veterans served (See Appendix D)	1,167	1,762	2,448
TOTAL STUDENTS SERVED (Duplications)	36,421	36,950	37,732

B. (1) Clientele - Employment Recruiters

	1968-69	1969-70	1970-71
No. of representatives from industry	276	257	187
No. of representatives from schools seeking teachers	126	133	100
No. of government representatives	47	30	35
No. of non-profit or social service agency representatives	8	6	15
TOTAL EMPLOYER REPS. VISITING CAMPUS	457	426	337
Interviews held on campus	5,637	4,744	3,806

B. (2) Clientele - parents, incoming freshmen, legislators, interested persons visit the office, telephone, write, wire, concerning scholarships, loans, grants, and part-time work. Industrial representatives, employers from federal state, and local governments and various agencies as well as school administrators also visit the office, phone, write, wire, giving information on jobs, company policy, aid to education, and request background information on seniors and former graduates. Our records indicate that over 17,000 incoming telephone calls were received in this office during the past year and over 90,000 pieces of mail were received.

5. PROFESSIONAL ACTIVITIES

NOTE: Due to a limited travel budget which was further reduced by a freeze on the unexpended portion the professional activities of the staff were severely limited.

(1) Mr. Edwards - participated in several U.Mass. Marketing Club Symposiums; served on a Personnel Office selection board; attended Peace Corps conference in Boston; attended Ag. & Food Econ. Dept. meeting for discussion of career planning and placement; assisted Bell Systems to conduct training center for recruiters at Campus Center; attended Federal Placement Conference at Natick Laboratories.

(2) Mr. Emery - visited the offices of the Veterans Administration and the State Selective Service Headquarters in Boston to discuss problems; two articles were accepted for publication in Yankee magazine.

(3) Mrs. Hardesty - attended Eastern College Personnel Officers conference at Portsmouth, New Hampshire; elected to Executive Board for two years term; attended E.C.P.O. Executive Board meetings at New York, Boston, New Jersey; attended E.C.P.O. & M.A.P.A. (Middle Atlantic Placement Assoc.) at Lafayette College, Easton, Pennsylvania; attended E.C.P.O. Membership Committee in Boston; gave evening talks to four sororities and three dormitories on career planning and placement; met with all sorority housemothers for similar discussion; assisted Bell Systems to conduct training center for recruiters at Campus Center; attended Federal Placement Conference at Natick Laboratories.

(4) Mr. Miller - attended meeting of Massachusetts Association of Student Financial Aid Administrators held at the University Campus Center; attended Northeastern Regional Office - College Scholarship Service Computation School held at Brandeis University; attended three meetings of the Five-College Financial Aid Officers.

(5) Mr. Morrissey - attended Federal Placement Conference at Natick Laboratories; attended College Entrance Examination Board and College Scholarship Service meeting at New Haven, Connecticut; assisted Bell Systems to conduct training center for recruiters at Campus Center; acted as consultant to College Placement Service aiding black colleges to improve their placement programs - visited Atlanta University Center which comprises - Morris Brown, Clark, Atlanta, Spielman, Morehouse Colleges; attended four Five-College (U. Mass, Smith, Mount Holyoke, Amherst, and Hampshire) Financial Aid Officers meetings, hosting one at U. Mass.; have aided several other colleges in financial aid and placement by sending our forms, pamphlets and ideas; had one radio and three television appearances to describe current placement activities; attended meeting of Massachusetts Association of Financial Aid Administrators at Campus Center on campus.

(6) Mr. Santner - visited Pennsylvania State University as consultant for disadvantaged program; attended Massachusetts Association of Student Financial Aid Administrators at Campus Center on campus; attended two Five-College Financial Aid Officers meetings.

(7) Mr. White - As member of New England Association of School, College, and University Staffing - named chairman of confidentiality of credentials committee; elected to Board of Directors, Workshop Moderator at NEASCUS Conference at Bedford, New Hampshire; listed in Phi Delta Kappa Speakers' Bureau and speaker at meeting; member of School of Education's "Change Gang" and "Dorm Visitation Team"; presenter at joint conference on Teacher Education, and conference at Westfield State College; co-founder and on Board of Directors of an alternative community school; published booklet on State Teacher Certification Reciprocity Policies in the United States; organized and works with University-wide Blood Bank; member of N.E.A., A.P.G.A., A.E.A., A.A.S.A.; accepted in doctoral program in School of Education.

6. MAJOR ACCOMPLISHMENTS

A. Improved and expanded use of data processing for financial aid awards and financial aid record keeping.

B. All graduate school catalogs now appropriately filed for each reference in labeled filing boxes in Placement Library.

C. Provided material and made available a printed Placement Manual which contained information about job hunting techniques, interview perspective, recruiting visits expected, etc.

D. Developed a collection of material from professional organizations describing opportunities and requirements of their respective fields.

E. Organized a student liaison committee from the Student Senate Service Committee to work out mutual problems with the Career Planning and Placement Service.

7. SPECIAL PROJECTS

A. Started planning for administrative changes wherein the Career Planning and Placement Service will be separated from Financial Aid which will come under Admissions and Records.

B. Corrected and refined portable slide series with sound track concerning career planning and placement to be shown in the fall in dormitories, fraternities, sororities, etc.

C. Redesigned placement registration forms.

D. Still investigating micro-filming possibilities for career planning and placement.

E. Coordinated training program for employment recruiters of Bell Systems wherein practice interviews with students were conducted, taped, video taped, and later judged. This program was held in the Campus Center.

F. Started on a revamping of career library collection to enable students to find specific information more readily and to cross reference where necessary.

8. FUTURE PLANS AND NEEDS

A. Making plans for new administrative change which will put Career Planning and Placement Service under Human Services, and Financial Aid under Admissions and Records.

B. We need an additional professional person to handle graduate student and alumni placement particularly in the area of educational and teacher placement.

C. A better travel budget and/or more frequent availability of a state car for employment contacts and conference attendance so important to these services.

D. Funds to enable us to purchase more career material for our placement library.

E. More file cabinets are sorely needed irrespective of Item F below.

F. Micro-filming of records is a must to accommodate the materials and credentials that must be kept long after students have graduated.

G. Some improvement on the telephone line for these services, particularly for the Career Planning and Placement Service.

H. Need electrofile or similar equipment since with size of files it has become impossible to sort out appropriate candidates for specific positions.

I. Need a sound-on-slide system to present career materials to students.

J. Need credential-reproducing capability within the Career Planning and Placement Office.

STUDENT PART-TIME EMPLOYMENT

	Women Working	Men Working	Total Students Working	Total Earnings
68-69	1,736	2,652	4,388 (to May 31)	$1,836,645 (to May
69-70	1,773	2,074	3,847 (to May 31)	1,447,876 (to May
70-71	1,833	2,198	4,243 (to May 31)	2,047,357 (to May

61,207 (including U.Mass.Boston) was earned by students from Work-Study funds through May 31
96,033 (including U.Mass.Boston) was earned by students from state funds through May 31.
90,117 (including U.Mass.Boston) was earned by students from all other trust funds through May 31

July 1, 1970 to May 31, 1971 (includes Work-Study)

	1971	1972	1973	1974	Stockbridge and Special	Grad. Students	Total
. employed om each class	987	1253	970	440	94	499	4243
tal earnings each class nc.part-time and trust funds, ants, and Work-udy funds)	$574,953	$624,802	$380,022	$135,832	$37,090	$294,658	$2,047,357

Earnings	No. of Students	Percent Working
rcent and No. of students who rned over $1,000	510	12%
rcent and No. of students who rned over $900 but less than $1,000	93	2%
rcent and No. of students who rned over $800 but less than $900	97	2%
rcent and No. of students who rned over $700 but less than $800	137	4%
rcent and No. of students who rned over $600 but less than $700	193	5%
rcent and No. of students who rned over $500 but less than $600	239	6%
rcent and No. of students who rned less than $500	2,974	69%

Percent of total student body who had part-time employment - 20%

COLLEGE WORK-STUDY PROGRAM
UNDER HIGHER EDUCATION ACT OF 1965

	Tot.No.stu.working (Amherst campus)	Total Earnings (Amherst)	Tot.No.stu.working (Boston campus)	Total Earnings (Boston)
1968-69	1,178	$232,645	359	$123,535
1969-70	910	440,454	313	196,408
1970-71	894	361,207	300	219,255

	No.stu.working off campus (Amherst)	Total Earnings stu.off campus (Amherst)	No.stu.working off campus (Boston)	Total Earnings stu.off campus (Boston)
Summer 1970	130	$88,197	40	$29,400

	No.stu.working on campus (Amherst)	Total Earnings stu.on campus (Amherst)	No.stu.working on campus (Boston)	Total Earnings stu.on campus (Boston)
1970-71	754	$273,010	260	$189,855

U.MASS, AMHERST STUDENT COUNT, 1970-71

UNDUPLICATED		TOTAL	
Summer Only	188	Summer	263
Summer & Academic Year	75	Fall	309
Academic Year Only	281	Spring	322
	544		894

Breakdown of student assignments follows - Amherst - (assigned by need and qualifications):

Department	No. of Students	Department	No. of Students
Anthropology	1	Mass. Review	2
Art	12	Mech. & Aero. Eng.	1
Assoc. Dean of Students	25	Microbiology	1
Athletics & Intramurals	30	Music	1
Botany	3	Nutrition and Food	1
Bus. Mgr. & Personnel	1	Photo Center	1
Central Mailing	3	Physics	1
Civil Engineering	1	Place. & Fin. Aid	12
Comparative Literature	1	Property Office	3
Copy Center	2	Provost	5
Data Processing	4	Psychology	15
Economics	1	Public Health	1
English	5	Purchasing	4
Fine Arts Council	3	R.S.O.	4
Forestry and Wildlife	4	Research Computing Center	10
Geography	2	Romance Languages	2
Geology	2	School of Business Admin.	1
Government	1	School of Education	15
Graduate School	6	Security	87
Hispanic Language	2	Sociology	7
History	2	Speech	2
Home Economics	4	Student Information Serv.	13
Hotel and Restaurant	3	Student Union	6
Human Development	5	Transportation Section	4
Library	38	University Press	4
Marketing	2	Wood Science & Tech.	2
		Zoology	5

APPENDIX B

LOANS

	1968-69	1969-70	1970-71
A. University Loans - Short Term			
Number Granted	281	276	419
Total Amount	$ 39,078.00	$ 40,514.00	$ 62,788.50
Average Amount Granted	139.00	147.00	149.00
B. National Defense Education Act Loan			
Number Granted	873	847	1,032
Total Amount	339,292.00	307,996.00	489,562.50
Average Amount Granted	388.00	364.00	475.00
C. Graduate & Foreign Student Loans (Graduate students also receive NDEA)			
Number Granted	66	62	109
Total Amount	6,124.00	5,655.00	14,994.00
D. Nursing Student Loans			
Number Granted	43	50	55
Total Amount	18,462.00	23,275.00	22,290.00
E. Massachusetts Higher Education Loans (HELP Loans through commercial banks after appropriate clearance through Placement & Financial Aid Office)			
Number Granted	2,293	2,505	2,502
Total Amount	2,076,899.00	2,337,607.00	2,488,004.00
Average Amount Granted	905.00	933.00	995.00
TOTAL NUMBER OF ALL LOANS	3,558	3,740	4,117
TOTAL AMOUNT OF ALL LOANS	$2,480,755.00	$2,715,047.00	$3,077,639.00

APPENDIX C

SCHOLARSHIPS, GRANTS-IN-AID, AND UNDERGRADUATE ASSISTANTSHIPS

	1968-69	1969-70	1970-71
A. Undergraduate Scholarships			
No. of applicants (includes freshmen who never came to the University)	11,570	13,375	11,160
No. of awards made to all classes (includes 264 Athletic Awards amounting to $193,347. for 1970-71)	1,132	1,684	1,085
Total amount of scholarships	$456,242.00	$633,778.00	$627,687.00
B. Undergraduate Assistantships (requires 8 hours of work per week)			
No. of awards	192	200	195
Total amount of awards	$109,800.00	$114,300.00	$111,900.00
C. University Endow., Trust & Misc.Scholar.			
160 awards each year	$62,137.00	$70,268.87	$71,972.61
D. Summer Scholarships			
No. of awards	139	155	66
Amount of awards	$29,762.00	$33,865.00	$17,910.00
E. Total No. of applicants for Scholarships	11,570	13,423	11,160
F. Total amount of scholarships, grants-in-aid and undergraduate assistantships	$657,951.00	$852,211.87	$829,469.61
G. Outside Scholarships			
No. of students receiving outside scholarships of which we are aware	2,527	2,200	2,435
Total amount of outside scholarships of which we are aware	$595,694.00	$679,450.00	$896,734.04

5	Special Students received outside scholarships totaling	$ 990.00
17	Graduate Students received outside scholarships totaling	2,596.00
321	Students in class of 1971 received outside scholarships totaling	81,698.00
435	Students in class of 1972 received outside scholarships totaling	153,254.00
525	Students in class of 1973 received outside scholarships totaling	162,221.00
1,132	Students in class of 1974 received outside scholarships totaling	495,975.00

University students received approximately $211,050.00 in scholarships from Massachusetts Board of Higher Education.

EDUCATIONAL OPPORTUNITY GRANTS

	1969-70	1970-71
Number of awards	715	480
Total amount of awards	$409,837	$377,363

NURSING SCHOLARSHIPS (FEDERAL)

	1969-70	1970-71
Number of awards	23	41
Total amount of awards	$13,200	$18,300

VETERANS

Total Veterans Enrolled	1968-69	1969-70	1970-71
Veterans enrolled under Public Law 894 (Disabled Veterans)	17	20	30
No. of students enrolled under Public Law 634 (War Orphans)	83	87	90
No. of students enrolled under Public Law 358 (G.I. Bill)	724	1,104	1,599
No. of students enrolled under Public Law 674 (Pension)	343	551	729
TOTALS	1,167	1,762	2,448

MILITARY DRAFT CERTIFICATION

Numbers of students for whom verification of status was processed for Local Selective Service Boards.

1968-69	1969-70	1970-71
9,465	7,565	8,158

Number of students registered for Selective Service here.

1968-69	1969-70	1970-71
282	332	261

WHAT MAJORS WERE THE EMPLOYERS SEEKING?
(Business, Industry, & Government)

1970	1971	
121	62	Organizations came to UMass looking for Accounting Majors
110	90	Organizations came to UMass looking for Business Majors
22	30	Organizations came to UMass looking for Economics Majors
164	103	Organizations came to UMass looking for Engineering Majors
11	9	Organizations came to UMass looking for Food Technology Majors
3	6	Organizations came to UMass looking for Home Economics Majors
6	8	Organizations came to UMass looking for Hotel Management Majors
105	59	Organizations came to UMass looking for Liberal Arts Majors
	10	Organizations came to UMass looking for Nursing Majors
148	69	Organizations came to UMass looking for Math. & Science Majors
43	54	Organizations came to UMass looking for All Majors
	4	Organizations came to UMass looking for Agriculture Majors

ORGANIZATIONS CAME TO UMASS LOOKING FOR ADVANCED DEGREES

1970	1971	
	3	M.B.A.'s
	1	All Majors
	13	Science & Math.
	12	Engineering
AL 21	13	

GRADUATE SCHOOLS CAME TO UMASS

1970	1971	
	12	Schools came to UMass looking for All Majors
	3	School came to UMass looking for Engineering Majors
AL 11	15	

CANCELLATION STATISTICS

The Placement Office arranged recruiting dates for 379 organizations. 79 of them cancelled for various reasons. In 1970 the numbers were 533 and 87.

1970	1971	
12	14	School systems cancelled a scheduled recruitment date.
13	6	Governmental agencies cancelled a scheduled recruitment date.
42	59	Business organizations cancelled a scheduled recruitment date.
67	79	

CLASS PLACEMENT SEASON BY EMPLOYER
November 16, 1970 - May 15, 1971

1 TYPE OF EMPLOYER	2 NUMBER OF ORGANIZATIONS SCHEDULED TO COME ON CAMPUS		3 % OF TOTAL ORGANIZATIONS		4 NUMBER OF INTERVIEWS WITH THIS TYPE OF EMPLOYER		5 % OF TOTAL INTERVIEWS		6 NUMBER OF DIFFERENT STUDENTS INTERVIEWING WITH THIS TYPE OF EMPLOYER		7 AVERAGE NUMBER OF INTERVIEWS TAKEN WITH THIS TYPE OF EMPLOYER (Col.4/Col.6)		8 AVERAGE NUMBER OF INTERVIEWS EACH TYPE OF EMPLOYER HAD ON CAMPUS (Col.4/Col.2)	
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971
SCHOOL SYSTEM	145	107	27%	28%	1319	1183	27%	31%	326	304	3.4	3.9	7.7	11.0
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971
GOVERNMENT	53	26	10%	7%	251	214	5%	6%	194	138	1.3	1.5	4.7	8.5
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971
BUSINESS & INDUSTRY	335	246	63%	65%	3174	2409	68%	63%	665	541	4.8	4.5	9.5	9.8
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971
TOTAL	533	379	100%	100%	4744	3806	100%	100%	1185	983			8.5	10.0
ACTUAL VISITS	426	300												

UMASS INTERVIEWS BY SCHOOL

November 16, 1970 - May 15, 1971

1	2		3		4		5		6		7	
SCHOOL	NUMBER ENROLLED		NUMBER REGISTERED		PERCENT REGISTERED		NUMBER OF STUDENTS TAKING INTERVIEWS		PERCENT OF THESE REGISTERED TAKING INTERVIEWS (Col. 5/Col. 3)		PERCENT OF THESE ENROLLED TAKING INTERVIEWS (Col. 5/Col. 2)	
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971
COLLEGE OF ARTS AND SCI.	1813	1780	725	569	39%	32%	220	185	30%	33%	12%	10%
COLLEGE OF AGRICULTURE	194	152	69	58	36%	38%	14	23	20%	40%	7%	15%
SCHOOL OF BUSINESS ADM.	365	356	227	202	62%	57%	111	144	50%	71%	30%	40%
SCHOOL OF EDUCATION	295	387	263	301	89%	75%	64	98	24%	31%	21%	25%
SCHOOL OF ENGINEERING	223	193	167	128	75%	66%	91	92	55%	72%	41%	48%
SCHOOL OF H. ECONOMICS	133	124	84	89	63%	72%	34	20	40%	22%	26%	16%
SCHOOL OF NURSING	117	94	31	62	26%	66%	3	29	10%	47%	[illegible]	31%
SCHOOL OF PHYS. EDUC.	130	198	88	119	68%	60%	11	37	13%	31%	8%	19%

REPORT ON THE CLASS OF 1970

Ten percent, or 340 students went on to further studies. Of these, 8 entered Dental School, 30 entered Law School, 12 entered Medical School, and 3 entered Theological Seminaries.

Other facts to be noted include: 9 entered the Peace Corps; 2 entered the V.I.S.T.A. program. Sixty three percent of the employed graduates are working in Massachusetts, Thirteen percent in Conneticut, Eight percent in New York State, with the remainder in 26 other states and overseas.

In the College of Agriculture, 6.6% (14 out of 221) went on to graduate school.

In the College of Arts and Sciences, 10.9% (193 out of 1762) went on to graduate school.

In the College of Business Administration, 7.2% (27 out of 326) went on to graduate school.

In the School of Education, 5% (17 out of 341) went on to graduate school.

In the School of Engineering, 6.7% (17 out of 252) went on to graduate school.

In the School of Home Economics, 6.7% (8 out of 119) went on to graduate school.

In the School of Nursing, 1.5% (1 out of 65) went on to graduate school.

In the School of Physical Education, 2.8% (5 out of 177) went on to graduate school.

In the School of Public Health, 15.2% (5 out of 33) went on to graduate school.

CLASS OF 1970

	Further Study	Non-Teaching Jobs	Teaching	Military Service	Housewife, No Other Plans	Plans Pending Or seeking Jobs	Unknown
College of Agriculture							
Male Grads 201	14	12	1	7	0	9	158
Female Grads 20	0	0	2	0	0	4	14
Total 221	14 (6.3%)	12 (5.4%)	3 (1.4%)	7(3.2%)	0 (0%)	13(6%)	172(78%)
College of Arts and Sciences							
Male Grads 988	132	33	15	44	0	50	714
Female Grads 774	61	43	58	0	10	64	538
Total 1762	193(11%)	76 (4.3%)	73 (4.3%)	44 (2.4%)	10 (.6%)	114(6.5%)	1252(71%)
School of Business Administration							
Male Grads 356	26	45	1	26	0	6	252
Female Grads 20	1	2	0	0	0	2	15
Total 376	27 (7%)	47 (12.5%)	1 (.3%)	26 (7%)	0 (0%)	8 (2%)	267(71%)
School of Education							
Male Grads 22	2	1	16	3	0	0	000
Female Grads 319	15	0	84	1	7	34	178
Total 341	17 (5%)	1 (.3%)	100 (29%)	4 (1.2%)	7 (2%)	34 (10%)	178(52%)
School of Engineering							
Male Grads 252	17	42	0	11	0	5	177
Female Grads 0	0	0	0	0	0	0	000
Total 252	17 (6.7%)	42 (16.6%)	0 (0%)	11 (5%)	0 (0%)	5 (2%)	177(70%)

		Further Study	Non-Teaching	Teaching	Service	Other Plans	Of Seeking Jobs	Unknown
School of Home Economics								
Male Grads	2	0	0	1	0	0	0	1
Female Grads	117	8	20	17	0	3	4	65
Total	119	8 (6.7%)	20 (16.8%)	18 (15%)	0(0%)	3 (2.5%)	4 (3.4%)	66 (55.5%)
School of Nursing								
Male Grads	1	0	0	0	0	0	0	1
Female Grads	64	1	24	0	1	1	2	35
Total	65	1 (1.5%)	24 (36.9%)	0 (0%)	1 (2%)	1 (2%)	2 (3%)	36 (55.4%)
School of Physical Education								
Male Grads	112	3	0	2	4	0	1	102
Female Grads	65	2	0	20	1	0	0	42
Total	117	5 (2.8%)	0 (0%)	22 (13%)	5 (3%)	0 (0%)	1 (.6%)	144 (81%)
School of Public Health								
Male Grads	9	2	1	0	0	0	3	3
Female Grads	24	3	6	0	1	0	0	14
Total	33	5 (15%)	7 (21%)	0 (0%)	1 (3%)	0 (0%)	3 (9%)	17 (51%)
TOTALS								
Male Grads	1943	196	134	36	95	0	74	1308
Female Grads	1403	91	95	181	4	21	108	901
Totals	3346	287 (8.6%)	229 (6.8%)	217 (6.5%)	99 (2.9%)	21 (6.3%)	182 (5.4%)	2209 (66%)

Professional Schools: Dental - 8; Law - 30; Medical - 12; Theological - 3;

Peace Corps - 9; V.I.S.T.A. - 2;

TYPES OF POSITIONS BY MAJORS

SCHOOL OF AGRICULTURE

Agriculture and Food Economics	
Assistant Manager	$833/month
Sales Manager	$708/month
Animal Science	
Junior Chemist	$666/month
Food Science	
Department Manager	$655/month to $900/month

COLLEGE OF BUSINESS ADMINISTRATION

Accounting	
Auditor	$612/month
Cost Accountant	$750/month
Assistant Accountant	$875/month
Accountant	$606/month to $900/month
Junior Accountant	$823/month to $836/month
Public Accountant	$875/month
Staff Accountant	$708/month to $900/month
General Business/Finance	
Clothes Salesman	$833/month
Computer Operator	$450/month
Employment Counselor	$1,000/month
Executive Trainee Program	$650/month
Junior Staff Associate	$750/month
Production Analyst	$750/month'
Registered Representative	$725/month to $850/month
Salesmen	$600/month
Management	
Assistant Manager	$700/month
Branch Management Trainee	$560/month to $855/month
Program Consultant	$658/month
Programmer	$650/month to $666/month
Projectionist	$400/month
Program Trainee	$725/month to $850/month
Management	$650/month to $750/month
Marketing	
Computer Systems Representative	$750/month
Management Trainee	$560/month to $855/month
Resident Director	$275/month
Sales Engineer	$675/month

COLLEGE OF ARTS AND SCIENCES

(MALES)

Art	
Artist	$10/month
Laborer	$580/month

Botany		
	Teacher	$550/month to $650/month
Chemistry		
	Junior Analytical Chemist	$ 600/month
	Lab Technician	$400/month
	Personnel Technician	$716/month
English		
	Assistant Buyer	$666/month
	Customer Service Reprentative	$583/month
	Insurance Agent	$600/month
	Reporter	$680/month
	Teacher	$550/month to $650/month
Geology		
	Soil Exploration	$580/month
Government		
	Lawyers Apprentice	$320/month
	Legislative Intern	$400/month
	Assistant Buyer	$666/month
History		
	Assistant Buyer	$666/month
	Insurance Agent	$600/month
	Lawyers Apprentice	$320/month
	Legislative Intern	$400/month
	Research Assistant	$666/month
	Supervisory Assistant	$670/month
	United Parcel Service	$583/month
Journalism		
	Insurance Underwriter	$668/month
Mathematics		
	Bank Examiner	$791/month
	Information System Designer	$676/month
	Internal Auditor	$700/month
	Management Trainee	$610/month
	Systems Representative	$750/month
	Teacher	$550/month to $650/month
Microbiology		
	Lab Technician	$400/month
Music		
	Teacher	$550/month to $650/month
Philosophy		
	Research Assistant	$666/month
	Staff Assistant	$650/month

Psychology

Insurance Agent	$600/month
Social Worker	$612/month
Reservation Sales Agent	$708/month
Janitor	$250/month
Warehouseman	$600/month

Sociology

Legislative Intern	$400/month
Lawyers Apprentice	$320/month
Insurance Agent	$600/month
Social Worler	$612/month

Zoology

Lab Technician	$400/month
Personnel Technician	$716/month
Research Assistant	$666/month
Teacher	$550/month to $650/month

COLLEGE OF ARTS AND SCIENCES (FEMALES)

Art

Artist	$10/month
Actress	$160/month

Botany

Stable Hand Instructor	$160/month
Research Assistant	$500/month

Chemistry

Assistant Registrar	$320/month
Personnel Technician	$725/month
Research Assistant	$500/month

English

Bus Operator	$200/month
Assistant Registrar	$320/month
Accountant Secretary	$520/month
Editorial Assistant	$540/month
Secretary	$380/month to $460/mont
T.W.A. Hostess	$500/month

Government

Banking Trainee	$400/month
Claims Representative	$416/month
Management Trainee	$530/month to $708/mon.
Service Representative	$462/month

History

Librarian	$470/month
Management Trainee	$530/month to $708/mon.

Journalism		
	Editorial Assistant	$540/month
	Office Clerk	$333/month
	Premium Specialist	$666/month
Mathematics		
	Management Trainee	$530/month to $708/month
	Digital Equipment	$1000/month
	Programmer	$583/month to $791/month
	Securities Transfer Assistant	$620/month
	Reviewer for Hospital Claims	$585/month to $615/month
Microbiology		
	Research Assistant	$500/month
Music		
	Teacher	$550/month to $650/month
Psychology		
	Premium Specialsit	$666/month
	Technical Specification Assistant	$825/month
	Case Worker	$575/month to $630/month
	Social Worker	$586.40/month
Sociology		
	Office Worker	$333/month
	General Office Assistant	$605/month
	Case Worker	$575/month to $630/month
Zoology		
	Research Assistant	$500/month
	Reviewer for Hospital Claims	$585/month to $615/month

SCHOOL OF EDUCATION

General Office Worker	$605/month
Teacher	$550/month to $725/month

SCHOOL OF ENGINEERING

Chemical Engineeer

Sanitary Engineer	$785/month
Experimental Engineer	$820/month
Chemical Engineer	$875/month

Civil Engineer

Civil Engineer	$702/month to $825/mo
City Planner	$785/month
Land Architect	$780/month

Electrical Engineer

Design Engineer	$955/month
Electrical Engineer	$875/month to $990/mo
Radiation Department	$875/month
Research Engineer	$850/month

Industrial Engineer

Industrial Engineer	$830/month to $920/mon

Mechanical and Aerospace Engineer

Aerospace Engineer	$895/month
Experimental Engineer	$820/month
Mechanical Engineer	$830/month to $960/mon
Project Engineer	$820/month
Test Engineer	$875/month

SCHOOL OF HOME ECONOMICS

Assistant Buyer	$520/month
Day Camp Counselor	$140/month
Dietetic Intern	$720/month
Executive Training Program	$480/month to $580/mon
Head Teacher (Child Care Center)	$725/month
Insurance Agent	$433.33/month
Junior Executive	$650/month
Management Development Trainee	$500/month to $540/mon
Playroom Director	$500/month
Retail Trainee	$685/month
Social Worker Aid	$460/month

SCHOOL OF NURSING

Graduate Nurse	$520/month to $556/mon.
Navy Nurse Corps	$400/month
Nurse	$600/month to $800/mon
Nurse Intern	$566/month
Registered Nurse	$627/month
Staff Nurse	$500/month to $650/mon

SCHOOL OF PHYSICAL EDUCATION

Physical Education

Teacher	$550/month to $650/mon

Recreation

Reservation Agent	$440/month
Recreation Director	$600/month

SCHOOL OF PUBLIC HEALTH

Lab Technician	$520/month
Medical Technologist	$585/mon to $67
Medical Technician Intern	$360/month
Naval Nurse Corps	$587/month

LOCATION OF NON-TEACHING EMPLOYMENT BY STATES

STATE	WOMEN	MEN	STATE	WOMEN	MEN
Connecticut	6	15	New York	10	17
Delaware	0	1	Ohio	0	2
Florida	0	2	Pennsylvania	1	5
Illinois	0	1	Rhode Island	2	5
Indiana	0	1	Texas	1	0
Kansas	1	0	Vriginia	1	0
Maryland	0	1	Washington D. C.	3	3
Massachusetts	66	55	Foreign (Including Peace Corps)	1	8
Michigan	1	0			
New Hampshire	0	2	V.I.S.T.A.	0	2
New Jersey	3	7			

LOCATION OF TEACHING EMPLOYMENT BY STATES

STATE	WOMEN	MEN	STATE	WOMEN	MEN
Alaska	1	0	Maryland	2	0
Colorado	1	0	Massachusetts	142	32
Connecticut	37	3	Michigan	1	0
Delaware	1	0	New Jersey	14	2
Florida	4	0	New York	5	3
Georgia	1	0	Pennsylvania	1	0
Illinois	3	1	Puerto Rico	1	0
Indiana	0	1	Texas	1	0
Kansas	2	0	Vermont	2	0
Kentucky	1	0	Virginia	1	0
			Washington D. C.	2	1

TOTAL LOCATION OF EMPLOYMENT BY STATES

STATE	WOMEN	MEN	STATE	WOMEN	MEN
Alaska	1	0	New Hampshire	0	2
Colorado	1	0	New Jersey	17	9
Connecticut	43	18	New York	15	20
Delaware	1	1	Ohio	0	2
Florida	4	2	Pennsylvania	3	5
Georgia	1	0	Puerto Rico	1	0
Illinois	3	2	Rhode Island	2	5
Indiana	0	2	Texas	2	0
Kansas	3	0	Vermont	2	0
Kentucky	1	0	Virginia	1	0
Maryland	2	1	Washington D.C. (Including Peace Corps)	1	8
Massachusetts	208	87			
Michigan	2	0	V.I.S.T.A.	0	2

UNIVERSITY OF MASSACHUSETTS

AMHERST

ANNUAL REPORT OF THE DEAN OF WOMEN

JULY 1, 1970 - JUNE 31, 1971

1968-69	1969-70	1970-71
1. Appropriation	F-21	F-21
The Dean of Women's budget was merged with Asso. Dean of Students under the general Student Personnel budget.	03 $100 10 125 13 500 14 250 14-1 250 $ 1,225	03 $100 10 125 13 700 14 200 14-1 $ 1,125 (other items in F-23)
2. Personnel		
26 former staff members (Professional assistants, Heads of Residence, and Senior Clerk/Stenographer) were transferred to the Asso. Dean of Students.	Junior Clk./Stenographer	Junior Clk./Steno.

4. Student Clientele

The Dean of Women has continuing concern for educational and personnel policies which effect all women students. Since 1967 assigned responsibility has been for off-campus women, including sororities.

1968-69	1969-70	1970-71
Total women undergraduates		
5,457	6,505	6,548
Off-campus women		
1,200 approximately	1,645 approximately	2,162 approx.

5. Professional activities

Massachusetts Association of Women Deans and Counselors (High School Guidance & College Deans) - State President (completed two-year term.)

National Association of Women Deans and Counselors ----Participating member of board of State Presidents. Attended national convention, St. Louis, March 1971.

Horace Smith Fund (Springfield)---Member of Board of Incorporators; assisted with grants to UM students.

New England Association of Colleges & Secondary Schools - Represented MAWDC in Annual Conference in Boston, December, 1970.

College Entrance Examination Board - On panel in program of regional meeting, Manchester, New Hampshire, February, 1971.

Massachusetts Society for the University Education of Women - Chairman of Deans Advisory Committee; arranged interviews and made recommendations for scholarships for UM students.

American Association of University Women--- Liaison for University of Massachusetts; member of local branch.

6-7 Accomplishments & Programs.

Offices at #235 Whitmore served "Off-Campus Student Affairs." In addition to the Dean of Women, the Fraternity Manager and the Greek Area Coordinator were located here. The Dean of Students' Assistant to confer with commuter men had to be located in #227 which was a less convenient arrangement than in the preceding year. Much credit for the friendly and efficient operation of the office is due to Marsha Middleton and Betty Lannon, secretaries, who work well together and are always responsive to the many students coming to the office.

Availability for any off-campus student to come for any reason proves to be very important. Fifty percent of my time was given to individual interviews, the balance to meetings of groups and organizations and to off-campus public relations and professional activities noted in paragraph five. Regular appointments included Presidents of Honor &/Service Societies, Alpha Lambda Delta, Gamma Sigma Sigma, Mortar Board, and of Sororities, Panhellenic Council, and occasional conferences with other student leaders.

New commuters were reached by mail and meetings which started some contacts. Others came to the office by referral or at their initiative for special scheduling, "incomplete" grade recommendations, withdrawals from courses or from the University - procedures which are routine but which often lead to disclosures of personal problems. Cooperation with Health, Mental Health, and Financial Aids offices gave additional assistance when needed or desired.

Many students move off-campus seeking less expensive living. Too often this is accomplished by over-crowding in apartments or houses, creating more problems for themselves and the community. Inadequate allowance for food points up their need for basic nutrition and consumer education. Exploration of this was begun with married students and the School of Home Economics and the Extension Service.

The former commuter's club is no longer feasible because of the wide discrepancy in ages, interests, and commuting distances. A better objective has been to encourage commuters to find their places in the variety of existing organizations. Scrolls have been helpful to some Freshman girls in this respect. The new Commuters Assembly gave wider representation in government and in allocations of their share of student taxes. One allocation was toward a University Day Care Center.

In counseling off-campus women, I have come to know many married or separated women who are attemping to complete their degrees; they have ability and high motivation but are often encumbered with personal problems. Some have responsibility for small children and would be greatly helped by availability of a Day Care Center while the student-parents are in class or at work. Some are returning former University of Massachusetts students; many are transfers. They need information about opportunities and procedures and referral to the right sources; they need counseling to help them define their own goals, problems and alternatives. I am participating in a Married Students Committee, recently initiated by Mr. Siddall of Mental Health and authorized by Vice Chancellor Bromery. The Committee hopes to extend University services to married students.

In the administration of the Margaret Hamlin Fund and emergency funds, I have learned of many critical problems and I am aware of great need for more scholarships for women at the University of Massachusetts. Although women excell in academic achievement they receive less than the University of Massachusetts men in scholarship assistance. Part of my work has been to promote more financial aid for students from outside organizations - The Massachusetts Garden Federation, Worcester Alumnae, Women's Clubs, MSUEW, Horace Smith Inc., AAUW, and Alpha Lambda Delta - but more assistance is needed. This is particularly true for women continuing their education after an interruption. Lack of adequate financial support from parents, scholarships or employment means that many women students go into debt to complete the bachelor's degree. Many talented women students who want to go to graduate school must postpone or abandon the goal.

Because of my continuing concern for educational opportunities for women, and for personnel policies which effect them, I have been involved in efforts to survey and to improve the status of women at the University of Massachusetts. (Note Addenda to my reports of the last two years.) The Faculty Senate has now added a standing committee on the Status of Women on which I will serve.

Adding the staff member, Mr. Paul Stevens, serving as Greek Area Coordinator, has been of great assistance, particularly in better organization of the new "Greek Council" activities and in officer-training. I have continued work with sororities and Panhellenic Council and continue as university-liaison with sorority resident advisers and in the recruiting and selecting of new ones where needed.

Sororities have contributed positively to the personal development of their members. Fine calibre upperclassmen have given leadership in sorority ideals, high scholarship, and conservative standards of behavior. The influx of younger members who have experienced wide freedoms in dormitory life is now effecting sororities. Social amenities are less and less important; rules about parietals and liquor are being relaxed. National Councils which have held chapters to strict house rules in the past are leaving decisions to local chapters - which under UM administration policy means student autonomy. Student autonomy in these matters means wide latitude for personal affairs. The peer influence is so strong among young people that it cannot be expected that many - or

even any - residences will vote to impose restrictions while others have personal freedom. "Diversity" in basic life styles in university residences sounds very good for publicity but is really a myth. Increasing numbers of the strongest and most loyal workers on alumnae advisory boards are disenchanted and are turning over volunteer duties to others. "Small group living" has value and appeal but its higher costs have a negative influence on sorority membership. What the future may be would be hard to predict.

8. Future plans and needs: The following are needs of the University of which I am aware.

   1. A top level study of the fraternities and sororities of the University of Massachusetts with a view to acceptance of fraternities and sororities as a part of the university residence system of "small group living centers."

   2. Information about UM student life needed at the secondary school level. Repeatedly it has been said by High School Principals and Counselors that the University of Massachusetts does an excellent job of describing and interpreting academic opportunities and admission requirements to High Schools, to their students and parents, but gives no conception at all of the student life at the University and what the requisites are for survival in personal and social life as well as in academic areas.

   3. Part-time students have demonstrated strong motivation and persistence and a large percentage of them have been high achievers. There should be a much larger admission of part-time students in regular degree programs of the University.

   4. The University should give recognition to students with excellent academic achievement. Still true is the Greek philosoper's statement, "What is honored in a community will flourish there." Recognition and publicity should be given to those achieving membership in National Honor Societies, to those attaining University Honors List each semester, to those completing Senior Honors projects and to those graduating from the university with honors. Recognition is gratifying to those deserving it, may be stimulating to others, and indicates to the public what the university values.

   5. Financial problems of students point up the need for promotion of more scholarship-giving by private organizations in communities throughout the Commonwealth. Many are generous but the university has done very little to recognize, or to promote good relations with, these donors, or, to acquaint students with these potential sources of financial assistance.

Respectfully submitted,

Helen Curtis

Helen Curtis
Dean of Women

6/14/71
HC/mbm

FEB 1979

Department of Public Health

ANNUAL REPORT

July 1, 1970--June 30, 1971

University of Massachusetts
Amherst, Mass.

To: Concerned and Appropriate Officials

Thru: Secretary, University of Massachusetts

Subject: Annual Report, Department of Public Health University of Massachusetts, Amherst, July 1, 1970 - June 30, 1971

Submitted is the Annual Report of the Department of Public Health for the period, July 1, 1970--June 30, 1971.

This report reflects a compilation of information and reports submitted by the faculty. In an effort to maintain brevity, many of the individual efforts and contributions were not included.

The faculty and staff will be pleased to provide any additional information which may be useful.

William A. Darity
Professor of Public Health
and Head Department

WAD:mf

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I. ACTIVITIES AND MAJOR ACCOMPLISHMENTS

A. General

During the period under review there was continuous support by faculty, staff and students in contributing to the growth of the department. One new essential course was approved which will broaden and strengthen the overall curriculum particularly at the graduate level. This course was Public Health 783 Organization and Management of Medical Care. Five courses were organized to provide a broader base as core courses required of all students and specialized areas. These were Public Health 361 (661) Principles of Environmental Health, Public Health 362 (662) Environmental Health Practices, Public Health 378 (678) Principles of Epidemiology, Public Health 372 (672) Epidemiological Investigation and Public Health 383 (683) Introduction to Health Administration.

An increasing interest in public health as a major field of study at both the undergraduate and graduate level has continued at the same momentum. There were, at the end of the academic year, 160 undergraduate majors in the department: 62 in public health and 88 in medical technology. The full-time graduate student enrollment which was 16 in the prior year, increased to 33 with the same number of part-time students, which was 5. During the ensuing year the number of full-time graduate students will increase considerably.

The academic background of graduate students who have been accepted for the academic year 1971-1972 continue to demonstrate an improvement in quality. Students who have confirmed enrollment at the graduate level beginning in September 1971 are from such schools as: Brooklyn College; Ohio State University; University of Maine; Towson

State College; Rutgers University; University of Northern Colorado; Amherst College; Springfield College; Boston College; Muhlenberg College; State University of New York, Binghamton; State University of New York, Buffalo; University of Hartford; Fordham University; University of New Hampshire, University of Massachusetts and University of Florida.

The Allied Health Professions grant was renewed April 14, 1970 in the amount of $35,000 for another year. Of this sum, $11,000 was allocated to the Nutrition and Food Department of the School of Home Economics, and $24,000 to the Medical Technology and Environmental Health Programs in the Department of Public Health. This support has helped in the quality and quantity of equipment and professional growth of faculty in both the medical technology and environmental health programs. From these funds library and reference texts and audio-visual materials have been augmented. Needed laboratory equipment and supplies have also been purchased. Faculty in both areas have been able to attend professional meetings, conferences and workshops. They can also attend short term courses under the provision of this grant.

The medical technology program is continuing to grow. The contract for affiliation with the Berkshire Medical Center was completed. As in the previous year, a small sum of $100.00 was made available through the Allied Health Grant to each affiliated hospital school of Medical Technology for the purchase of teaching materials. These materials will be on loan to these hospital schools as long as they maintain an affiliation with the University of Massachusetts.

The major continuing need for strengthening all programs in the department are: (a) more faculty, (b) creative research on health related problems (c) adequate administrative funding and (d) financial support for graduate students.

B. Undergraduate

The program of study at the undergraduate level has become a very popular area for students. This program of study was strengthened and broadened so that graduates in either public health Option I or Option II would be able to perform at first level public health career development positions or go on to graduate school. The quality of the background of students either enrolling as freshmen or those who transfer is both adequate and satisfactory to follow a rather rigorous course sequence. There were 62 undergraduates enrolled in this sequence.

Due to Miss Judeth A. Crowley, who is interested in the total departmental growth, the Medical Technology program, which was once operated as a separate entity in the Department of Public Health is now in a much closer association with the Department.

There were 88 students enrolled in the medical technology program. Fortunately, as with the public health option, the quality of students has improved yearly. More students are now remaining on the campus for the full four year academic option. This approach may require some reorganization which will require including some public health courses.

The Department continued to participate in the work concerned with the establishment of an Institute on Man and His Environment. The new courses proposed will provide electives for students in public health.

During October 1970, an accreditation review team from the National Association on Environmental Health made a site visit to the University to review the undergraduate program of study. Following this visit, the program was granted full accreditation.

C. Graduate Studies

During the academic year 1969-70, it was necessary to cancel an

accreditation visit by the American Public Health Association for the Master's Program in community health education. (See Annual Report 1969-1970) Fortunately a site visit was made by a team in September 1970 and the program was given provisional accreditation. There were 3 major provisions which must be met in order to receive full accreditation (1) the addition of another faculty by September 1971 in community health education, (2) adequate space provided for graduate students, and (3) an improvement in library acquisitions, particularly state and federal documentation. The additional faculty member has been recruited in community health education and he will be joining our faculty in September 1971.

Full accreditation is important, not only for establishing and maintaining professional standards but it will make possible the continuous applying to HEW for traineeships to support students studying in this curriculum. The first support was made through an award from HEW of four traineeships in 1971-72, six for 1972-73, and six for 1973-74.

In addition to traineeships awarded by the U.S. Public Health Service for support of graduate students in community health education, support has continued for students in environmental health - seven during the period under review, and funds for the support for eight during the 1971-72 year has been awarded. Two traineeships have been awarded for graduate studies in health statistics. Two environmental health graduate students will continue to be supported by Air Pollution Grant Funds. These funds are from a cooperative endeavor with the School of Engineering. This cooperation has continued as a constructive viable endeavor.

Dr. Warren Litsky, Commonwealth Professor of Environmental Sciences has revised the Health Laboratory Science course of study. Five graduate students were enrolled in this sequence during the past year and another ten have been

accepted for the coming year. Seven students were enrolled in the health administration program of study; two foreign students and five in U.S. Nationals. Six of these students will continue during the coming year. More cooperative efforts are planned with other departments, so that the health administration program will be strengthened.

There were eight students enrolled in the community health education option. Of those enrolled, six will continue, one completed studies in February, and one will complete studies in August 1971.

One student was enrolled in the epidemiology and biostatistics option during the period under review, three were enrolled in the health laboratory science program, and two in the air pollution program of study.

D. Other Graduate Activities

Students were accepted for study in the health statistics program area for the first time and will be enrolled in September 1971. One student was enrolled in the Master of Arts in Teaching (M.A.T.) program of study in the Medical Technology all during the 1970-71 academic year. Four will be accepted for the coming year, 1971-72; all of which will concentrate in the secondary or elementary teaching sequence. The cooperative effort with the School of Education continues to be fruitful.

E. Research

During the period under review, research in the Department, included studies in: (a) Attitudes and Barriers to Family Planning; (b) Community Awareness in Rehabilitation and Home Care; (c) Health Indices and Abortion; and (d) Administrative Pathways to Health Action in the Community. Evaluation studies in health delivery systems are also being carried out. The department must continue to emphasize faculty members developing creative health studies so that graduate students will benefit from these studies. The department data bank is continuing

to develope in order to support student research.

In addition to faculty research, graduate students carried out research in some of the following areas as a requirement for the Master of Science degree: (a) A Study of Male Attitudes as a Barrier to Family Planning; (b) A Study of Perception of Services and Health Delivery; (c) A Predictive Model for Respiratory Admissions in Springfield, Massachusetts; (d) Some Behavioral Effects in Rats Due to Exposure to Low Levels of Carbon Monoxide; (e) The Affects of Noise on Temporary Shifts in Human Hearing Thresholds; (f) A Comparison of Direct and Indirect Flourescent Antibody Staining Methods for the Secao Streptococci; (g) Tuberculocidal Activity of Disinfectant Detergents.

F. Continuing Education and Special Activities

Continuing education is considered an important functional aspect of the Department of Public Health. Through a grant from the Higher Education Act, Title I, the research-action project, which was organized to assist in improving the administrative system in the delivery of health services, is continuing.

The Department was a co-sponsorer, with the Communicable Disease Center, of a training course in Epidemiological Methods. This was attended by health officials from all New England States.

As a special activity, in order to maintain cooperation with the community colleges, the Department continued to work very closely with the Massachusetts Board of Community and Regional Colleges in the development of the health careers programs at the junior college level. A University representative from the Department of Public Health has served for the last three years on the State Advisory Committee on Public and Environmental Technology and continues to serve on this committee.

The Department will continue to support Continuing Education. In order that this will continue to be given a high priority, a faculty member has been designated Departmental Coordinator of Continuing Education. He will work closely

with the University Continuing Education Program.

II. NEEDS, ASSOCIATED RELATIONS AND PROJECTIONS

A. Needs

There is an increasing need for professional public health personnel at all levels. Leadership and directorship personnel has become critical because of the changing approach in the delivery of health services. The pressing need is for qualified specialists at graduate levels of preparation; that is, at the Masters and Doctorate levels. The purpose and objectives of the Department of Public Health should be to prepare personnel to serve in the public and private sector of health services at all levels.

Faculty - In order to meet these objectives the departmental need must be considered. The most pressing need in the department is additional faculty and supportive staff. There has been support provided for faculty members. Nevertheless, in order to achieve a pattern where the overall program of study might be considered for accreditation as a School by the APHA, additional faculty are needed in Community Health Education, Health Administration, Environmental Health (Air Pollution), Epidemiology, Biostatistics, and Health Laboratory Science. It is recommended that one additional faculty in each area be added during 1972-73.

Space - The pressing need for space in the department has not been alleviated. The present space arrangement still does not provide for good administration. Teaching faculty are presently located in Draper Hall and the Public Health Building. However, with incoming faculty, all space will have been used to the limit. There is no space for graduate assistants, nor graduate students. This problem must be solved by September 1, 1971.

A proposal is being prepared for long-term space arrangement in the Life Sciences Building.

B. Financing and Budgeting

The operational budget of the Department for the year under review was $16,000. This budget was supplemented by Trust Funds for about the same amount. In order for the department to function effectively, a two year budgetary allowance for sufficient equipment, supplies, teaching support, travel and rentals is necessary. After this, replacements only will be necessary. In order to attract first rate faculty, it is necessary to be able to commit some funds for administrative and research supplies and equipment. The Departmental Head needs adequate funds for this purpose.

In order to meet the needs of the Department, an operational budget of at least 6 to 7 times the present budget is required.

C. Clarification of Goals and Objectives

The faculty of the Department of Public Health has had many discussions during the year with regard to the future of the Department. It seems now that the goal is to broaden the base of the department and develop a School of Public Health and Health Science as an integral part of the University. In this connection, an independent school where the public health programs of study and cooperative programs with Nursing, Nutrition and Food, Engineering and Education would be a part of the graduate program. In addition to the public health sequences, which are Air Pollution, Community Health Education, Environmental Health, Epidemiology and Biostatistics, Health Administration, Health Laboratory Science and Health Statistics, administered in the Department, there will be developed Public Health Nutrition jointly with the Nutrition and Foods Department in the School of Home Economics, and Public Health Nursing jointly with the School of Nursing. These will be similar to the Master of Arts in

Teaching in Health which has been organized with the School of Education.

The undergraduate program will remain as it presently is, but will form what will be known as the Health Science curriculum.

D. Staff

Staff support is necessary as faculty is added. In public health, because of many laboratory courses, it is necessary to provide both administrative and technical support. With the addition of a technical assistant during the last fiscal year, the program has functioned much better. Two clerical administrative staff members are necessary almost immediately.

E. Faculty Status

Dr. Helen Jean Thiebaux, Assistant Professor, Public Health, resigned. She will be replaced by Dr. Alan J. Gross, Associate Professor of Public Health. Dr. Gross joins us from U.C.L.A., where he has been for the last 8 years.

F. Projections

There is a commitment on the part of the faculty to further develop the cooperative, mutually dependent associations, the Schools of Education, Engineering, and Home Economics. Association is being developed with the School of Nursing. In addition, continuing relationships with the natural biological, physical, behaviorial, and social sciences must be strengthened. Mutual programs of support are essential to the growth of the public health curriculum. This is, likewise, important for other programs in which public health faculty and students are associated.

The Department of Public Health must project into the future. The major objectives during 1971-72 should be the full accreditation of

a Master's program in Community Health Education, establishment of a Ph.D. program, and development of a long range proposal for a School of Public Health. By the academic year 1972-73, specific plans should be made with regard to the direction the department will go.

III. OTHER

A. Grants

Grants in the amount of $72,000 from N.I.H. were made to the Department for educational improvement and student support.

A research grant in the amount of $117,000 by N.I.H. was made to the Department for family planning research.

Proposals for further research, student support and educational improvement have been made to N.I.H. and other federal agencies.

IV. STUDENT ENROLLMENT

	1968-69	1969-70	1970-71
(a) Majors			
1. Med. Tech.	98	110	88
2. Pub. Hlth.	26	36	62
3. Pub. Hlth. (Graduate)	15	21	38
TOTAL	139	167	188
(b) Students taught:			
1. Univ. of Mass.			
1st. semester	354	562	538
2nd. semester	379	458	573
2. Stockbridge	85	93	88
TOTAL	818	1113	1199

V. APPROPRIATION

Account	1968-69 (Appropriations)	1969-70 (Appropriations)	1970-71 (Appropriations)
03	$ 4000.00	$ 5700.00	$ 6200.00
06	--	--	--
10	650.00	650.00	650.00
11	--	--	--
12	250.00	431.75	484.00
13	5150.00	5550.00	6000.00
14	400.00	400.00	400.00
14.1	1000.00	1200.00	1000.00
14.3	--	--	1200.00
15	1000.00	900.00	1000.00
15.1	--	--	--
16	62.13	100.00	--
	$12,512.13	$14,931.75	$16,934.00

VI. PERSONNEL

	1968-69	1969-70	1970-71
Chairman, part-time	1	-	-
Professor, Department Head	1	1	1***
Professor (part-time) (Dir. Water Resources Research Center)	-**	1	1
Professor (part-time) (Dir. of University Health Services)	-	1	1
Associate Professor	-	-	2***
Assistant Professor	2	3	4***
Assistant Professor (part-time) (Dir. Env. Hlth. & Safety)	1	1	-
Instructor	2	1	2***
Instructor (part-time)	2	2	-
Lecturer (part-time)	2	-	2
Adjunct Professor	1	1	1
Secretary (Jr. Clerk)	2	1	1
Senior Clerk	-	1*	1*
Senior Clerk Stenographer	-	1	1
Technical Assistant	1	1	2

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* Paid from HEW-Allied Health Funds.

** Leave of absence

*** Full-time faculty

VII. ADMINISTRATIVE STRUCTURE (Academic program Areas)

Dean - None
Head - Darity

Hlth Laboratory Science	Hlth Services Administration	Community Hlth Education	Med. Tech.	Environmental Hlth & Air Pollution	Epidemiology & Biostatistics
Prof. Litsky****	Assoc.Prof. Moustafa	Prof. Darity	Crowley (Instr)	Prof. Berger**	Asst. Prof.Thiebaux
	Prof. Gage*****	Asst. Prof. Read		Assoc. Prof. Peters	Asst. Prof. Tuthill
	Adj. Prof. Peterson*			Asst. Prof. Wisnieski	
				Instr. Dinardi	
				Lecturer Reed***(1)	
				Lecturer Stryker***(2)	

Jr. Clerk -- 1
Senior Clerk - (AHI) grant 1
Senior Clerk Stenographer

* Director, Western Regional Office, Massachusetts Department of Public Health. Serves as Adjunct Professor

** Director, Water Resources Research Center, Professor of Public Health.

*** Staff Assistant, Environmental Health and Safety (Serves as Lecturer in Department - (1) Teaches a section of P.H. 378; (2) Teaches P.H. 337.

**** Commonwealth Professor of Environmental Sciences (Taught P.H. 379/679 and P.H. 380/680. Directed graduate research.)

***** Director of University Health Services

VIII. FACULTY ACTIVITIES

APPENDIX

CROWLEY, JUDETH A., M.S., Instructor

Professional Activities

Massachusetts Association of Medical Technologists

Recording Secretary

Chairman - Education Committee

State Council member

Legislation committee member

Chairman, Seminar - "Evaluation Techniques in Medical Technology Education", Boston, Mass., April 22, 23, 24, 1971

American Society of Medical Technologists

Planning Committee - Region I Convention

Scientific Assembly - Technologists in Education

Chairman, Panel - "Graduate Education for Medical Technologists" at annual meeting, Las Vegas, Nevada, June 15, 1971

New England Symposium-on Medical Technology Education

Recording Secretary

Consultant in Medical Mycology - Mercy Hospital, Springfield, Mass. and R. J. Moriarty, M.D., Springfield, Mass.

Department of Public Health - Representative on Council of Undergraduate Academic Deans

Association of Schools of Allied Health Professions Council on Baccalaureate and Higher Degree Programs

Ed.D. candidate - University of Massachusetts

Meetings and Conferences Attended

Second International Congress of Parasitology - Washington, D.C. September 8-12, 1970

ASMT Region II Convention - Washington, D.C., October 9-10, 1970

MAMT Semi-Annual Meeting - West Springfield, Mass., October 11, 1970

NESMTE - Merrimack College, November 18, 1970

ASAHP 3rd Annual Meeting - Chicago, Illinois, November 19-24, 1970

Crowley, Judeth A. (cont.)

Meetings and Conferences Attended (cont.)

ASMT Region I Convention - Grossinger's, New York, December 2-4, 1970

ASMT Seminar, "Medical Technology Education", Monterey, California, January 24-29, 1971

Board of Schools of Medical Technology - Workshop on accreditation of schools - Newark, New Jersey, April 16-17, 1971

MAMT Annual Meeting - Boston, Mass., April 22-24, 1971

ASMT Annual Meeting - Las Vegas, Nevada, June 10-18, 1971

Paper Presented

"Why Graduate School?", ASMT Annual Meeting, Las Vegas, Nevada, June 15, 1971

DARITY, WILLIAM A., Ph.D., Professor of Public Health

PROFESSIONAL ACTIVITIES

Professional Organizations

National:

President, Society for Public Health Education, Inc.

Executive Committee and Board of Directors, Planned Parenthood Federation of America

Population Task Force, American Public Health Association

Meetings Attended:

American Public Health Association, Houston, Texas, November 1970

Society for Public Health Education, Inc., Houston, Texas, November 1970

American Association, Planned Parenthood Physicians, Kansas City, Missouri, April 1971

State:

Contract and Qualification Committee and Board of Directors, Massachusetts Tuberculosis and Respiratory Disease Association.

Local:

President and Board of Directors, Hampshire County Public Health Association

Board of Directors, Hampshire Association for Mental Health
Connecticut Valley Health Planning Council

Within University

Graduate Curriculum Committee and Member, Graduate Council

Member, Committee for Collegiate Education of Black Students (CCEBS)

Board of Directors, and President, Faculty Club.

Member, Committee for Evaluation of Research Involving Human Subjects.

Member, Coordinating Committee, Institute on Man and His Environment.

Member of one Ph.D. Committee in Sociology, two Doctorate Committees in Education and one Ph.D. Committee in Government.

Darity, William A. (cont.)

Within University (cont.)

Directed one Masters Thesis

Public Service

Public Health Review Committee, P.H.S. - H.E.W.: Reviewed grant proposals in Washington 3 times during year. Made site visits to review public health programs to: (1) School of Public Health, University of Texas at Houston; (2) School of Public Health, Tulane University.

Advisory Committee on Public and Environmental Health Technology, Massachusetts Board of Community Colleges

Speaker or Program Participant

National Institute of Health Workshop on Family Planning, Contraception, Sex Education and Morality, September 1970

American Association of Planned Parenthood Programs, Kansas City, Missouri, April 1971

Seminar on Evaluation of Health Education Programs, World Health Organization, Brazzaville Republic of Congo, Africa, June 1971

Massachusetts Pediatrics Association, May 1971

"Family Planning and Birth Control", Y.W.C.A., Holyoke, Mass., February 12, 1971

Research

Study on Rehabilitation and Home Care (grant from Franklin County Public Hospital)

Study on Militancy, Race Consciousness and Attitude Toward Family Planning (grant NICHD); Principal Investigator, $117,000 for first year of 2 year study.

Publications

"A study of Attitudes and Knowledge in a Low Income Population--An Assessment of Barriers to Family Planning", Advances in Planned Parenthood, Vol. VI, 1971. (with H. J. Thiebau)

Darity, William A. (cont.)

Publications (cont.)

"Health Knowledge Level of Secondary School Students", Health Education Journal, December 1970 (with Clayton Shaw)

"National Health Crisis: Is There a Solution?" Journal of Massachusetts Recreation and Park Society, Vol. 1, No. 1, 1971

"Race Consciousness and Fears of Black Genocide as Barriers to Family Planning", Population Reference Bureau, Sel. No. 37, June 1971 (with C. Turner and H. J. Thiebaux) pp. 5-12

Major Papers Presented

"Family Planning, Race Consciousness and The Fear of Race Genocide", Workshop on Research Approaches to Sex Education, Contraception, Family Planning and Morality, NIH, Bethesda, Maryland, September 14-15, 1970 (accepted for publication in the American Journal of Public Health)

"An Exploratory Study on Barriers to Family Planning: Race Consciousness and Fears of Genocide as the Basis", American Association of Planned Parenthood Physicians, Kansas City, Missouri, April 1971 (accepted for publication Advances in Planned Parenthood)

"The National Health Crisis and its Affect on the Delivery of Health Care", Massachusetts Association of Pediatrics, Boston, Massachusetts, May 12, 1971

"Community Health Education Methods and Principles", WHO Seminar on the Evaluation of Health Education Programmes, Brazzaville, Republic of Congo, June 9-17, 1971

DiNARDI, SALVATORE R., Ph.D., Instructor

Professional Activities Outside University

American Chemical Society

Sigma XI Society

Attended, Second International Clean Air Congress of the International Union of Air Pollution Prevention Associations, Washington, D.C., Dec. 6-11, 1970

Professional Activities Within University (outside Health Services)

Chairman of Core Curriculum Review Committee

Lecture and discussion on "The Present Status of Air Monitoring" in Prof. N. Ford's Orchard Hill course "The Problems in Air".

Courses Taught:

Fall 1970 - P.H. 123, Dynamics of Personal and Community Health

P.H. 361/661, Environmental Health I (with H. A. Peters)

Spring 1971 - P.H. 331/631, Introduction to Occupational Health (with H. A. Peters)

Civil Engineering 700, Air Sampling and Analysis (with F. A. DiGiano)

Courses Proposed:

P.H. 776, Civil Engineering 776, Air Sampling and Analysis

P.H. 385, The Environment and Public Health

Publications:

Ph.D. Thesis, "The Exchange of Alcohols with Octahedral and Tetrahedral Cobalt (II) Complexes", April, 1971

(Recommended for promotion to Assistant Professor, effective, September 1, 1971)

GAGE, ROBERT W., M.D., Professor of Public Health

Professional Activities Outside University

American College Health Association
Chairman, Committee on Junior/Community Colleges, 1970-71

AMA-ACHA Liaison Committee

Speaker, annual meeting, New York State College Health Association, May, 1971

Speaker, annual meeting, American Association of Junior Colleges, March, 1971

Massachusetts Chapter, American Academy of General Practice
2nd Vice-President

Member, Professional Advisory Committee, Massachusetts Easter Seal Society

Member, Society for Adolescent Medicine

Member, American Public Health Association

Professional Activities Within University (outside Health Services)

Chairman, University Health Council

Member, Board of Admissions and Records

Member, Faculty Senate

Member, Selection Committee for Dean, School of Physical Education

Member, Study Committee, School of Nursing

Member, University Commission on the Environment

Member, Committee for Evaluation of Research Involving Human Subjects

Participant, summer counseling

Member, Doctoral Committee, one student in Department of Psychology

Member, Doctoral Committee, one student in School of Education

Department of Public Health

Chairman, Personnel Committee

Member, Graduate Student Admission Committee

Gage, Robert W. (cont.)

Community Services

Chairman, Amherst Citizen Review Commission

Publications

Editor, Manual for Junior/Community College Health Programs, American College Health Association, 1971.

"Report of a Preliminary Study of Pregnancy on the University Campus", J. American College Health Association, Vol. 19, No. 2, December 1970, pp. 111-113 (with Lawrence B. Siddall and Michael A. Cann).

"Developing a Health Program for the Community College", J. American College Health Association, Vol. 19, No. 3, February 1971, pp. 152-158.

LITSKY, WARREN, Ph.D.

Offices and Committee Membership

President (1970-71) - Connecticut Valley Branch of American Society for Microbiology

Member, Editorial Board of Applied Microbiology

Member, Editorial Board of Health Laboratory Science

Consulting Editor of Journal of Environmental Health

Contributing Editor of Industrias Lacteas

American Public Health Association

- Subcommittee on Standard Methods for the Analysis of Water and Waste Water
- Laboratory Section Council
  - Committee on Publications
  - Program Committee
  - Committee on the Microbial Contamination of Surfaces
- Environmental Sections
  - Food Protection Committee

American Association for Contamination Control

- Hospital Environment Committee

Major Advisor to Student Research Projects

Christopher Libby
Elisabeth Beauvais
Nancy Miller
Mrs. Alexander
Theresa Airoldi

Grants

Hampshire Public Health Association Grant

Research Projects

- Airborne Bacteria
- Bacterial Shedding (Kimberly-Clark)

Litsky, Waren (cont.)

Grants (cont.)

Research Projects (cont.)

Bacteriostatic and Bactericidal Activity of Glycerine

Fluorescent Antibody Methods for Determination of Fecal Streptococci

Microbial Intervention in the Eutrophication Process

Cooperative Programs

One Student in Marine Science Program (Carol Fisher)

Lectured on Nursing Home Sanitation, Short course at Division of Continuing Education

Advising eight M.S. students in Dept. of Public Health

Teaching P.H. 379/679, and 380/680

Hold the rank of Professor (Affiliate), of Biology at Clark University

Presented a two-week course in the Microbiology of Polluted Waters for the Epic Program of Westfield School System

Publications

Scientific Articles:

Litsky, Warren and J. T. Reynolds, Formal Discussion on Experimental Investigation of Cellulolysis in Mud by M. Laurent. Advances in Water Pollution Research, Proceedings of the 4th International Conference, Prague, 1969, Pergamon Press, Oxford, 1970. pp. 923-924

Evans, D. A., D. J. Hankinson and Warren Litsky, Heat Resistance of Certain Pathogenic Bacteria in Milk Using a Commercial Plate Heat Exchanger, J. Dairy Science, 1970. 53:1659-1665

Litsky, B. Y. and Warren Litsky, Bacterial Shedding During Bed Stripping of Reusuable and Disposable Linens as Detected by the High Volume Air Sampler, Health Lab. Science, 1971. 8:29-34

Litsky, Warren (cont.)

Publications (cont.)

Abstracts:

Litsky, B. Y. and Warren Litsky, 1970, Bacterial Shedding During Bed Stripping of Reusable and Disposable Linens as Detected by the High Volume Air Sampler. Absts. of the A.P.H.A. Meeting, October 1970. p. 126

Pavlova, M. T., Warren Litsky and F. J. Francis, 1970, A Comparative Study of Starch Hydrolysis by Fecal Streptococci Employing Plate and Tube Techniques. Absts. of the A.P.H.A. Meeting, October 1970. p. 285

Pavlova, M. T., F. T. Brezinski and Warren Litsky, 1971, Fluorescent Antibody Techniques for the Identification of Group D. Streptococci. Bact. Proc. 1:55.

Wun, C. K., J. R. Cohen and Warren Litsky, 1971, The Effect of Minor Variations in Media Production in the Colonial Appearance of Salmonellae and Shigellae. Bact. Proc. 1:91.

Extension:

Litsky, Warren and H. B. Gunner (editors). 1970. Massachusetts Directory of Water Pollution Control Consulting Engineering Firms. A publication of the Technical Guidance Center for Indust. Environ. Control, University of Massachusetts, Amherst, Mass.

Litsky, Warren, H. B. Gunner and Ruth Kreplick. 1970. New Directions in Solid Wastes Processing. Proceedings of a conference held at Framingham, Industrial Environmental Control, University of Massachusetts, Amherst, Mass.

Special Recognition

Appointed member of Mass. Executive - Legislative Commission on Solid Waste Management Programs

Elected Fellow of the American Academy for Microbiology (May 1970)

Presented Invited paper at the Conference on the Microbiology of Semi-Preserved Foods. Prague, Czechoslovakia. October 1970

Appointed Special Consultant to Federal Water Quality Administration, Department of Interior.

Appointed Special Consultant to Bureau of Hospital Facilities, D.H.E.W.

Litsky, Warren (cont.)

Special Recognition (cont.)

Invited to participate on the Panel of Research Activities of the National Conference on Food Protection, Denver, Colorado, April, 1971

Invited to present a paper on the Training of High School Teachers at the Summer Institute of Environmental Quality, Michigan State University.

Panel Member and Speaker at 3rd Biennial Conference for Massachusetts Legislators

Invited Speaker at Roundtable on "Potential Control of Bacterial Aerosols Generated in the Dental Operatory" at the American Society for Microbiology Annual Meeting. 1971

Invited to moderate session on Water Pollution Ecology at the American Society for Microbiology, Annual Meeting, 1971

MOUSTAFA, A. TAHER, M.D., Dr.P.H., Associate Professor

Professional Activities Outside University

Member, Egyptian Medical Syndicate

Member, Egyptian Public Health Association

Member, American Public Health Association

Member American Hospital Association

Member, American Association of University Professors

University Activities

Served on Committee to Study an all University Health Plan

Served As Chairman, Department Reorganization Study Committee

Meetings Attended

American Public Health Association, Annual Meeting, Houston, Texas, October 1970

Classes Taught

Public Health 683, Health Administration - 25

Public Health 383, Health Administration - 6

Public Health 684, Health Organization - 6

Public Health 384, Health Organization - 4

Public Health 700, Special Research - 4

Public Health 783, Seminar in Medical Care - 1

Publications

Moustafa, A. T., "An Epidemiological Approach to the Study of Incidence of Surgical Procedures", with Arnold I. Kisch, M.D., Medical Care, Vol. 7:6, November-December, 1969

Moustafa, A. T., "Factors Involved in the Choice of a Health Insurance Plan", with Carl E. Hopkins, Ph.D., Medical Care, Vol. 9:1, January-February, 1971

Roemer, M. I. (ed.), Health Insurance Plans, Studies in Organ-

Publications (cont.)

izational Diversity, University of California, Los Angeles, 1969 (contributor)

Grebler, L. (ed.), *The Mexican-American People*, The Free Press, New York, 1970 (contributor)

PETERS, HOWARD A., Ph.D., Associate Professor of Public Health

Professional Activities (outside University)

Chairman, Environmental Control Committee, Massachusetts Public Health Association

Member, Population Committee, National Environmental Health Association

Member, Executive Committee, Air Conservation Council of the Hampden-Berkshire TB-RD Association

Panelist, Environmental Interdependence Education Conference, Springfield Technical Community College, April, 1971

Moderator, Panel Discussion, Spring Technical Meeting of the New England Section, Air Pollution Control Association, Rhode Island College, April, 1971

Program Committee Member for 1971 Annual Meeting of the New England Public Health Association

Elected, Fellow, American Institute of Chemists

Elected, Member, American Industrial Hygiene Association

Speaker, Williamsburg Women's Club, March, 1971

Attended Annual Meeting, Air Polution Control Association, St. Louis, Missouri, June, 1970

Attended Annual Meeting, American Public Health Association, Houston, Texas, October, 1970

Professional Activities within University

Member, Graduate Council

Member, 1 Ph.D. Committee in Mechanical Engineering

Directed four Masters Thesis, served as member of four additional Masters thesis committees.

Joint appointment, Department of Civil Engineering

Project Director, Environmental Health Training Grant, NIH

Co-Director, Air Pollution Training Grant, NAPCA (with Engineering)

Departmental Committees: Graduate Admissions, Core Curriculum, and Long Range Planning.

Peters, Howard A. (cont.)

Professional Activities within University (cont.)

Guest Lectures in Orchard Hill, Nursing and Mechanical Engineering Courses

Courses Taught:

P.H. 331/631, Introduction to Occupational Health

P.H. 332/632, Introduction to Air Pollution

P.H. 361/661, Environmental Health I

P.H. 362/662, Environmental Health II

Publications:

"The Noise that Surrounds us", J. Massachusetts Recreation and Park Society, Vol. 1, No. 1, 1971, pp. 20-22.

PETERSON, JEROME S., M.D., M.P.H. Adjunct Professor

Member of Board of Directors of Holyoke-Chicopee Mental Health Assn.

Member of Board of Directors of Planned Parenthood League of Massachusetts

Member of House of Delegates of Easter Seal and a member of the Program Planning Committee

Served as consultant to United States Agency for International Development for evaluation of small pox-measles program in certain African countries

Consultant in Public Health and Preventive Medicine, Cooley Dickinson Hospital, Northampton, and Franklin County Public Hospital, Greenfield

Coordinator of a two-day seminar for nursing home administrators under the Division of Continuing Education, University of Massachusetts

Resource Consultant to Health Congress organized by the Mass. Department of Public Health for local health workers and board members.

Served as a group leader at an all-day conference sponsored by the Massachusetts Committee on Children and Youth to prepare a statement for presentation to the White House Conference on the same subject

Represented the Massachusetts Department of Public Health at a meeting of the American Medical Association Council on Rural Health in Boston at the time of the AMA clinical session and contributed to the report of this meeting.

READ, DONALD, Ed.D., Assistant Professor of Public Health

Publications

Co-author, Creative Teaching in Health, New York: Macmillan Co., 1971, pp. 437

New Directions in Health Education, New York: Macmillan Co., 1971 pp. 270

Co-author, Introducing Health, New York: Macmillan Co., due 1973 pp. 600

Community Activities

Member, Committee to develop a health education curriculum in Amherst High School

Gave lecture on "A Comprehensive Health Education Program" at Frontier Regional High School February 1971

Campus Activities

Invited to attend informal discussion at Sigma Sigma Sigma Sorority, April 1971

Taught a course in Human Sexuality for Orchard Hill Spring 1971 semester

Invited to teach a course in Human Sexuality for project 10 Spring 1971 semester

Gave lecture on Homosexuality at Home Economics Department, April 1971

Nominated to represent Graduate School on the Committee on the Status of Women at the University

Departmental Activities

Was instrumental in making contact with and setting up a meeting with Dr. Ryder, who is the director of Grants for Comprehensive Public Health Services. This has allowed the Department to pursue possible grant money for a Comprehensive Health Program.

Wrote up and submitted grant proposal for a grant for our MAT program to support three students in higher education to Health, Education, and Welfare

Developed an information pamphlet concerning MAT work in Health Education to hand out to students

Read, Donald A. (cont.)

National Activities

Attended S.S.S.S. meeting in New York City, January 1971

Attended New England Psycologist's Association meeting in New York City, 1971

Attended National A.A.H.P.E.R. meeting in Detroit, Michigan, April, 1971

Attended New England Health Education Association meeting in Rhode Island

Attended drug conference meeting in Boston, Massachusetts, 1971

Courses Taught

P.H. 311/611, Human Sexuality and Sex Education
P.H. 304/604, School Health (2 sections)
Human Sexuality - Orchard Hill
Human Sexuality - Project 10

Current

Working on MAT Grant proposal for four students to do graduate study leading to teaching in elementary/secondary school

Working on third proposal for federal funding for MAT program in Health Education

Working on article based on survey of over 200 female students at University of Massachusetts to be completed this summer

Invited to attend and give discussion on new innovations in "group work" at National Elementary and Secondary Physical Education meeting in Pennsylvania this coming September 1971

Invited to work with all incoming freshman students at Pratt Institute in Brooklyn, New York using group methods this coming September 1971

Invited to review new textbook by Lester Kirkendall on human sexuality

Planning a workshop tentatively entitled "Sex Education: A Current Assessment" to be planned for this coming September-October 1971

REED, GEORGE H., M.P.H., Lecturer

Professional Activities (outside Univeristy)

Attended Eighth Annual Yankee Conference on Environmental Health, Hyannis, Ma., September 2-4, 1970

Attended Forty-Ninth Annual Meeting of American College Health Association, San Francisco, Calif., April 27-30, 1971.

Chairman, Standards Committee Environmental Health and Safety Section, American College Health Association

Professional Organizations

Member, American Public Health Association

Member, National Environmental Health Association

Member, Massachusetts Environmental Health Association

Member, American College Health Association

Member, Campus Safety Association, National Safety Council

Professional Activities within University (outside Department of Pub. Health)

Staff Asst., Environmental Health and Safety, University Health Services

Guest Lecturer, short-course, Methods of Epidemiological Investigation, "Epidemiological Approaches to Man-Made Health Problems - An Overview."

Guest Lecturer, Stockbridge course coordinated by Dr. Hain Gunner, "Changes in Foodborne Diseases Due to Modern Food Technology".

Guest Lecturer, course on Human Sexuality, coordinated by Prof. Marjorie Sullivan, School of Home Economics, "Venereal Disease."

Community Services

Treasurer and Chairman, Education Committee, Hampshire Assn. for Mental Health

Member, Planning Committee, Conference for Clergy and Mental Health Professionals, Smith College, October 27, 1970

Member, Planning Committee, Institute for Educators, sponsored by the Mental Health Assn. of Greater Springfield and the Hampshire Assn. for Mental Health, Springfield, Mass., August 15, 1971.

Reed, George H. (cont.)

Community Services (cont.)

Attended Legislative Conference, Massachusetts Association for Mental Health, Boston, February 2, 1971

Research Grants and Activities

Received a U.S. Public Health Service Traineeship Grant for Short-term Training, for 30 traineeships, held March 22 to April 2, 1971: "Methods of Epidemiological Investigation".

Course Taught

P.H. 378/678, Epidemiology

STRYKER, JAY W., M.S., Lecturer of Public Health

Professional Activities Outside University

Associate Member, Sigma XI

Member, New England and National Health Physics Society

Member, American Public Health Association

Member, Higher Education Section, National Safety Council

Member, American Association for the Advancement of Science

Member, Society of Nuclear Medicine

Member, American Nuclear Society

Attended Annual Health Physics Society, Chicago, July 1970

Pesented lectures on Radiation Safety to personnel of Western Massachusetts Hospital, Westfield, August 1970

Attended Joint Meeting of New England, Connecticut and New York Chapter of Health Physics Society, May 1971

Professional Activities Within University (outside Health Services)

Department of Public Health:

Lecturer

Chairman, Admissions Committee

Faculty Research Grant awarded for construction of a prototype cart for handicapped persons

THIEBAUX, H. JEAN, Ph.D., Assistant Professor

Publications

"A Study of Attitudes in a Low-income Population - An Assessment of Barriers to Family Planning" (with W. A. Darity), Advances in Planned Parenthood, Vol. VI (1971)

Professional Activities

Grant from NICHD for $117,000 for the development of study of ethnic consciousness as a barrier to fertility control, jointly with W. A. Darity, William J. Wilson and Castellano Turner

Data analysis and preparation of article entitled "A Study of Attitudes of Low-income Adults: An Inquiry into Barriers to Family Planning" with W. A. Darity

Study and data analysis on "Public Health Aspects of Abortion."

Attended numerous New England Statistical Association meetings

Allied Social Science Association meeting, December 1970, Detroit, Michigan (panel participant)

Grant of $7,000 from N.I.H. to support 2 graduate students in Health Statistics

Professional Public Service

Member of the Board of Directors of Planned Parenthood Committee of Pioneer Valley

University Activities

Graduate Curriculum Revision Committee, Public Health

Preparation of Prospectus for Health Statistics Graduate Program of Study

Courses Taught

P.H. 375/675, Public Health Statistics
P.H. 776, Evaluation of Public Health Research

TUTHILL, ROBERT W., Ph.D., Assistant Professor of Public Health (Epidemiology) First year

Professional Organizations

Society for Epidemiological Research

American Public Health Association; Epidemiology Section

American Sociological Association and Section on Medical Sociology

New England Public Health Association

Massachusetts Public Health Association

Honor Societies

Delta Omega

Pi Gamma Mu

Sigma Xi

Professional Meetings Attended

American Public Health Association

New England Public Health Association

Massachusetts Public Health Association

Departmental Activities

Courses taught: P.H. 378/678, 2 semesters, 2 sections
P.H. 372/672, 1 semester

Special problems and thesis: four students

Committees: Core Curriculum
Library Liaison Officer

Other On-Campus Activities

Taught in and assisted in the organization of an Epidemiology Short course: "Methods of Epidemiological Investigation". This course was presented at the University of Massachusetts in cooperation with the Center for Disease Control, H.E.W., and was designed for personnel of health agencies in the New England region.

Tuthill, Robert W., (cont.)

Other On-Campus Activities (cont.)

Helped develop questions for a written exam on Medical Sociology of a Sociology doctoral candidate.

Community Activities

Consultation with Massachusetts State Department of Public Health and Berkshire Voluntary Nursing Association

Consultation with University of Massachusetts School of Nursing and Model Cities, Springfield.

Publications and Papers

Robert W. Tuthill, "The Research Design for a Study of Nursing in a School Health Program". Presented at the American Public Health Association Meeting, October, 1970.

Earl Siegel, Donald B. Thomas, Robert W. Tuthill, Elizabeth Coulter and Sidney S. Chipman, "Factors Associated with Involvement of Low-Income Women in a Public Family Planning Program", American Journal of Public Health. (August 1970): 1382-1394.

WISNIESKI, KAROL S., M.P.H., Assistant Professor in Public Health

Activities

Professional Societies:

Massachusetts Public Health Association, Awards Committee

New England Public Health Association, Member

American Public Health Association, Fellow

Massachusetts Environmental Health Association, Board of Directors

National Environmental Health Association (Formerly, National Association of Sanitarians) Member of National Accreditation Council For Undergraduate Curricula in Environmental Health.

American Intersociety for the Certification of Sanitarians, Inc., Founder Diplomate.

Speaker and Program Participant:

UNDERGRADUATE TWO-YEAR PROGRAMS IN ENVIRONMENTAL HEALTH Presented at the 35th Annual Educational Conference of the National Environmental Health Association, Portland, Oregon, June 30, 1971.

Community and State-wide Activities:

Member, Board of Health, Amherst

Functional Manager for Health, Town of Amherst, Project SCAN of State Department of Community Affairs.

Consultant, Massachusetts Division of Civil Service

Member, Review Committee for Comprehensive Health Planning, Massachusetts, Assisted in review of 8 P.L. 89-749, Section 314 (b) regional grant applications.

University Activities:

Member of Faculty Senate

Member, Faculty Senate Committee on Continuing Education

Coordinator, Environmental Health Factors Nursing for Nursing Home Administrators, January 29-30, 1971, Division of Continuing Education, Seminar for Nursing Home Administrators.

"Rates, Ratios, and Proportions". Presented as part of short course, Methods of Epidemiological Investigation March 22, 1971, Division of Continuing Education in cooperation with U.S. Department HEW, Public Health Service.

Wisnieski, Karol S. (cont.)

Grant:

Title I, Board of Higher Education, Massachusetts, entitled Administrative Pathways to Public Health Action in the Community, $7,200, Continued to September 1, 1971

Courses taught:

P.H. 263, Institutional Hygiene and Sanitation

P.H. 563, Institutional Hygiene and Sanitation

Bacteriology S-1, S-3 (I & II)

DEPARTMENT OF THE AIR FORCE
DETACHMENT 370, AIR FORCE ROTC (AU)
UNIVERSITY OF MASSACHUSETTS, AMHERST, MASSACHUSETTS 01002

ANNUAL REPORT OF THE DEPARTMENT OF AIR SCIENCE

1. APPROPRIATIONS - by fiscal year (FY)

		FY 69	FY 70	FY 71
01	Salaries, Permanent Positions	$11,905.00	$7,670.00	$7,932.25
03	Services, Non-Employees	200.00	200.00	200.00
04	Food	30.00	50.00	30.00
10	Travel & Automotive Expense	100.00	100.00	100.00
12	Repairs & Alterations	100.00	100.00	100.00
13	Special Supplies & Expenses	450.00	450.00	500.00
14	Office & Administrative Expenses	150.00	35.00	-
14-1	Telephone	700.00	815.00	782.00
		$13,635.00	$9,420.00	$9,644.25

2. PERSONNEL - as of September

	1968	1969	1970
Colonel	1	1	1
Major	1	0	1
Captain	2	2	2
TSgt	2	2	2
SSgt	2	1	1
Principal Clerk (Grade 9)	1	1	1
Military Property Clerk (Grade 5)	1	0	0
TOTALS	10	7	8

3. ORGANIZATIONAL CHART - See Attachment #1.

4. STUDENTS OR CLIENTELE

a. Number of Majors -- None.

b. Number of students taught -- September

	1968	1969	1970
Air Science 1	152	110	54
Air Science 2	50	42	22
Air Science 3	29	32	20
Air Science 4	39	34	29
TOTALS	270	218	125

5. FACULTY PUBLICATIONS, RESEARCH GRANTS, RESEARCH PROJECTS, AND OTHER PROFESSIONAL ACTIVITIES

a. Hayes, Robert E., Major, "Be a Leader Later" -- A Simulation of Blake's ladership Grid, AFROTC Education Bulletin: AFROTCRP 50-1, Vol 13, Number 6, bruary 1971, Maxwell Air Force Base, Alabama, pp 11-18.

b. Duto, Michael D., and Robinson, Hugh T., "The Problem--Retention. An alysis of AFROTC at the University of Massachusetts." AFROTC Education Bulletin: ROTCRP 50-1, Vol 13, Number 7, March 1971, Maxwell Air Force Base, Alabama, pp 8.

6. MAJOR ACCOMPLISHMENTS

a. The Department of Air Science commissioned 23 students during FY 1971.

b. The College Scholarship Program, formerly the Financial Assistance Grant Program authorized by "The ROTC Vitalization Act of 1964," which provides tuition, fees, and books for those students selected for the program, has been successful. Following is the number of scholarships this department has received since Academic Year 1966/67:

Year	Number
Academic Year 66/67	7
Academic Year 67/68	9
Academic Year 68/69	21
Academic Year 69/70	15
Academic Year 70/71	17

c. Flight Instruction Program. Eight students successfully completed the Flight Instruction Program during Fiscal Year 1971.

d. During 1971 the Department has forwarded ten course proposals through channels for review by the Faculty Senate. The course revisions involve increased participation by University faculty, as well as updated reference materials.

7. SPECIAL PROJECTS OR PROGRAMS:

The University of Massachusetts Allan B. Bunce Squadron of the Arnold Air Society (AAS), a cadet honor society, received considerable recognition during the year. In addition to several service projects conducted during 1970-1971 (including over $1100 collected for the Pakistani Relief Fund) the Area Staff held a Conclave in Northampton for eight Cadet Squadrons in the Northeast.

The University Angel Flight, affiliated with the Allan B. Bunce Squadron, was active during the year assisting the Arnold Air Society in the Pakistani Relief Fund drive and other service projects. Over $200 was sent to a South Vietnamese Orphanage to buy powdered milk for the children there.

8. FUTURE PLANS AND NEEDS:

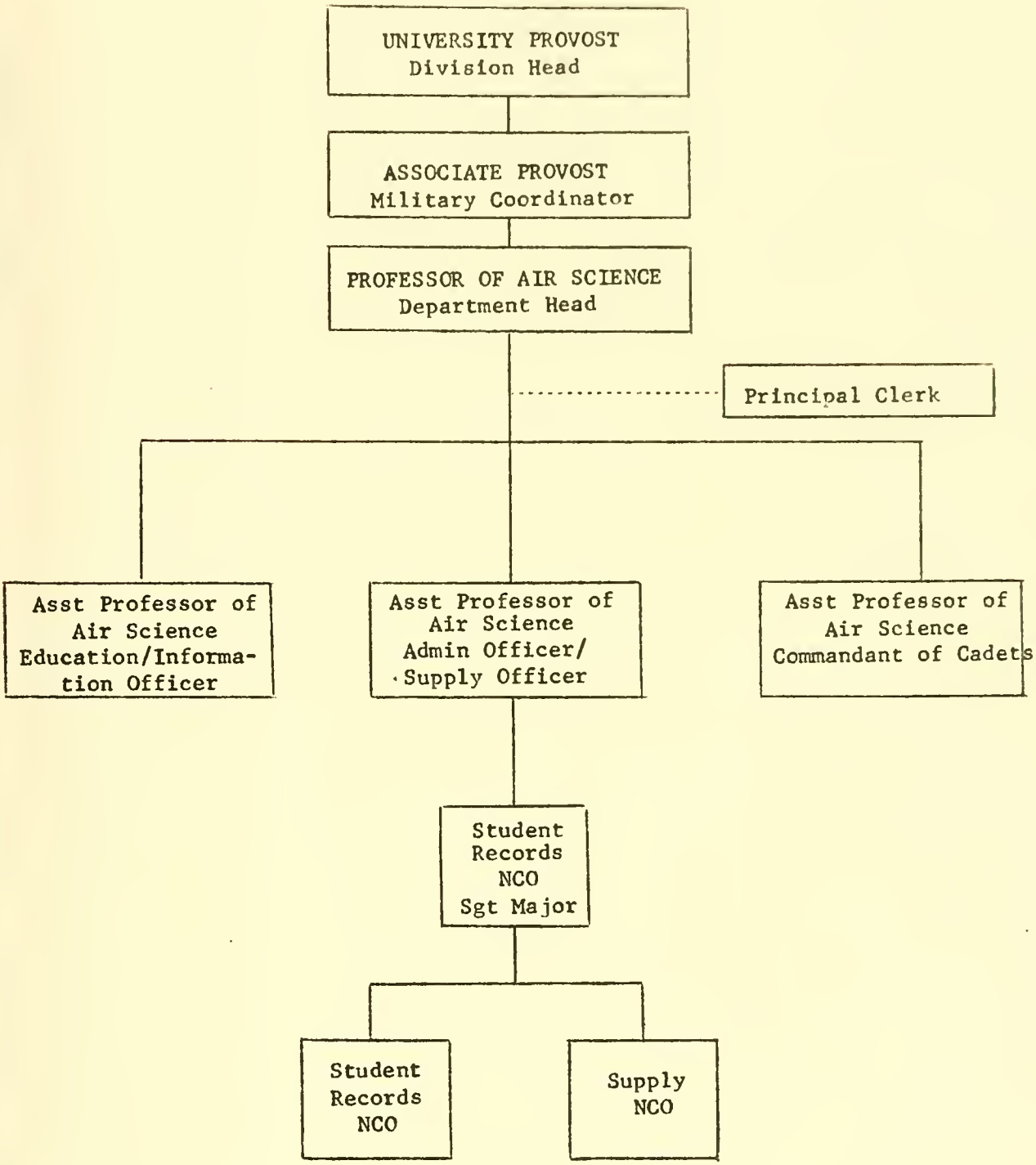
The Department will continue to develop its curriculum and teacher qualifications to insure the maintenance of an educational program that meets the requirements of students, the University, and the United States Air Force. The basic problem confronting this Department is a lack of fully-qualified students interested in the program because of a general anti-war, anti-administration syndrome, a malaise which may require a lengthy period to cure.

ROBERT E. HAYES, Lt Colonel, USAF
Acting Professor of Air Science

1 Atch
Organizational Chart

ORGANIZATIONAL CHART

DEPARTMENT OF AIR SCIENCE



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